VOLUME LVII
NUMBER FOUR

THE NATIONAL GEOGRAPHIC MAGAZINE

APRIL, 1930

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TO carry out the purposes for which it was founded forty-two years ago the National Geographic Society publishes this Magazine monthly. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole, and has contributed $55,000 to Commander Byrd's Antarctic Expedition.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society has conducted extensive excavations at Pueblo Bonito, New Mexico, where prehistoric peoples lived in vast communal dwellings before the days of Columbus; it is sponsoring an ornithological survey of Venezuela, and is maintaining an important photographic and botanical expedition in Yünnan Province, China.

TO further the study of solar radiation in relation to long range weather forecastings, The Society has appropriated $65,000 to enable the Smithsonian Institution to establish a station for six years on Mt. Brukkaros, in South West Africa.

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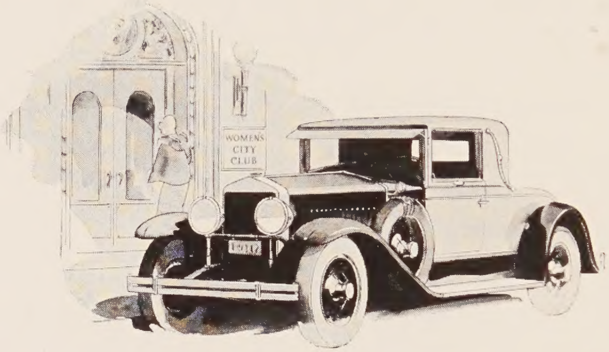

THOUSANDS of business and professional men, as well as women from all walks of life, have discovered that there is true economy in the purchase of a *good used car.*

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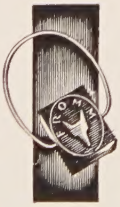

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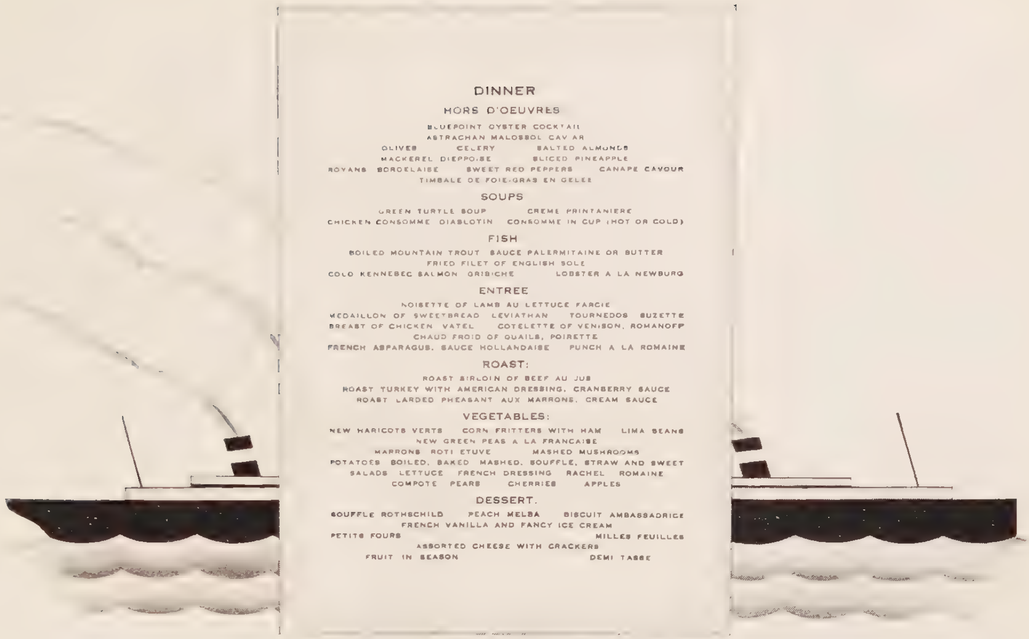

DINNER

HORS D'OEUVRES

BLUEPOINT OYSTER COCKTAIL
ASTRACHAN MALOSSOL CAVIAR
OLIVES CELERY SALTED ALMONDS
MACKEREL DIEPPOISE SLICED PINEAPPLE
ROYANS BORDELAISE SWEET RED PEPPERS CANAPE CAVOUR
TIMBALE DE FOIE-GRAS EN GELEE

SOUPS

GREEN TURTLE SOUP CREME PRINTANIERE
CHICKEN CONSOMME DIABLOTIN CONSOMME IN CUP (HOT OR COLD)

FISH

BOILED MOUNTAIN TROUT SAUCE PALERMITAINE OR BUTTER
FRIED FILET OF ENGLISH SOLE
COLD KENNEBEC SALMON GRIBICHE LOBSTER A LA NEWBURG

ENTREE

NOISETTE OF LAMB AU LETTUCE FARCIE
MEDAILLON OF SWEETBREAD LEVIATHAN TOURNEDOS SUZETTE
BREAST OF CHICKEN VATEL COTELETTE OF VENISON, ROMANOFF
CHAUD FROID OF QUAILS, POIRETTE
FRENCH ASPARAGUS, SAUCE HOLLANDAISE PUNCH A LA ROMAINE

ROAST:

ROAST SIRLOIN OF BEEF AU JUS
ROAST TURKEY WITH AMERICAN DRESSING, CRANBERRY SAUCE
ROAST LARDED PHEASANT AUX MARRONS, CREAM SAUCE

VEGETABLES:

NEW HARICOTS VERTS CORN FRITTERS WITH HAM LIMA BEANS
NEW GREEN PEAS A LA FRANCAISE
MARRONS ROTI ETUVE MASHED MUSHROOMS
POTATOES BOILED, BAKED MASHED, SOUFFLE, STRAW AND SWEET
SALADS LETTUCE FRENCH DRESSING RACHEL ROMAINE
COMPOTE PEARS CHERRIES APPLES

DESSERT.

SOUFFLE ROTHSCHILD PEACH MELBA BISCUIT AMBASSADRICE
FRENCH VANILLA AND FANCY ICE CREAM
PETITS FOURS MILLES FEUILLES
ASSORTED CHEESE WITH CRACKERS
FRUIT IN SEASON DEMI TASSE

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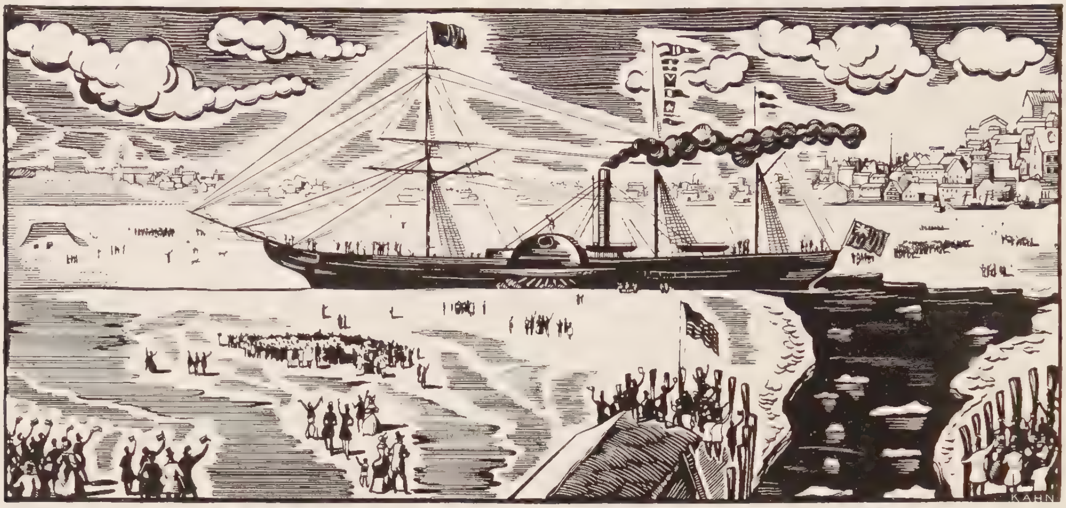
THE BRITANNIA, ICE BOUND -1844



What **SAMUEL CUNARD** *did for Boston Boston never Forgot*

IT was the 30th day of January in the year 1844. The people awoke to a strange and awesome sight. There lay before them the entire Boston Harbour "from the Ferryway to the Narrows," a solid sea of ice. And wedged tight in the ice, helpless and unable to turn a paddle, was "Boston's most beloved ship"—the Britannia—with her sailing date only 3 days away; Europe awaiting her mails; and 65 persons booked for the passage.

The Britannia—the Palatial Passenger Packet of Mr. Samuel Cunard—the same Samuel Cunard who with his great fleet of ships—so says the Memorial History of Boston—had doubled Boston's foreign business and brought to Boston new workers and great prosperity.

A great wave of sympathy and friendliness sweeps the people — Mr. Martin Brimmer, Boston's Mayor, calls the Selectmen and the Merchants to a hurried council at "the Exchange" —money must be raised to cut the Britannia out of the ice. There must be no expense to Mr. Cunard—and on the committee were appointed "such sterling citizens as Ozias Goodwin, Caleb Curtis, Ammi Lombard and Samuel Quincy." $3,000 was raised in a twinkling. And at dawn on February 1st, 1,500 men were hard at work with horses and ploughs, picks and axes and apparatus of every sort. Thousands turned out on the ice on skates to watch and to cheer, and there were horse-sledges and boats on runners and tents for refreshments. THE THIRD DAY SAW THE MIRACLE PERFORMED. A grateful citizenry had cut a great canal in the ice, 10 miles long and 200 feet wide and the BRITANNIA WAS FREE.

All this was a "Labour of Love" for Boston thought of that unforgettable day in July 1840, when the Britannia, the First Cunarder, had appeared in its Harbour—when Ezra Gannett in his sermon in the Federal Street Meeting House had said of her coming: "I confess that no event which has occurred since the commencement of the present century seems to me to have involved more important consequences to this city."

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The Standard Oil Company of Indiana is among the many industrial users of Ford tri-motored, all-metal airplanes for regular business purposes. Stanolind has employed three of these famous planes. The first was delivered in May, 1927, and the latest, "Stanolind III," in July, 1929. Between July and December last, "Stanolind III" has flown a distance greater than around the earth at the Equator.

Directors of the Standard Oil Company of Indiana have flown 97,087 miles in the Company's three Ford tri-motored planes, having used them regularly on business trips. In addition to these, many thousands of passengers have been carried.

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FORD MOTOR COMPANY

Visitors are always welcome at the Ford Airport at Detroit

The Ford Plane

The Ford plane is planned, constructed and operated as a commercial plane. Built of corrugated aluminum alloys, it has great structural strength, unequaled durability, and is most economical to maintain in operation. The uniformity of its material is determined by scientific test. All planes have three motors in order to insure reserve power to meet and overcome all emergencies. The engines may be Wright or Pratt & Whitney, air-cooled, totaling from 900 to 1275 horse-power. Ford planes have a cruising range of from 580 to 650 miles at speeds between 55 and 135 miles per hour. Loads may be carried weighing from 3670 to 6000 pounds.

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(VINCENT LOPEZ)

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No brush No lather No rub-in
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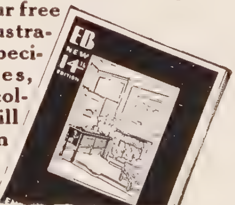

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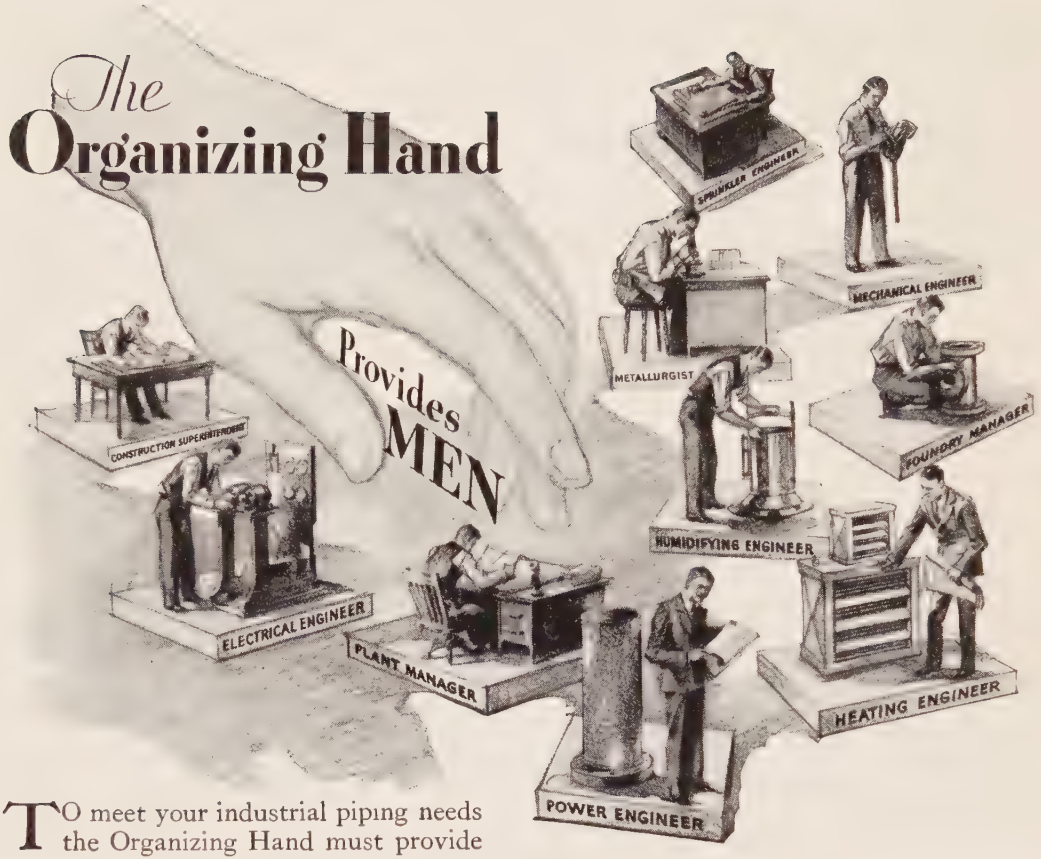

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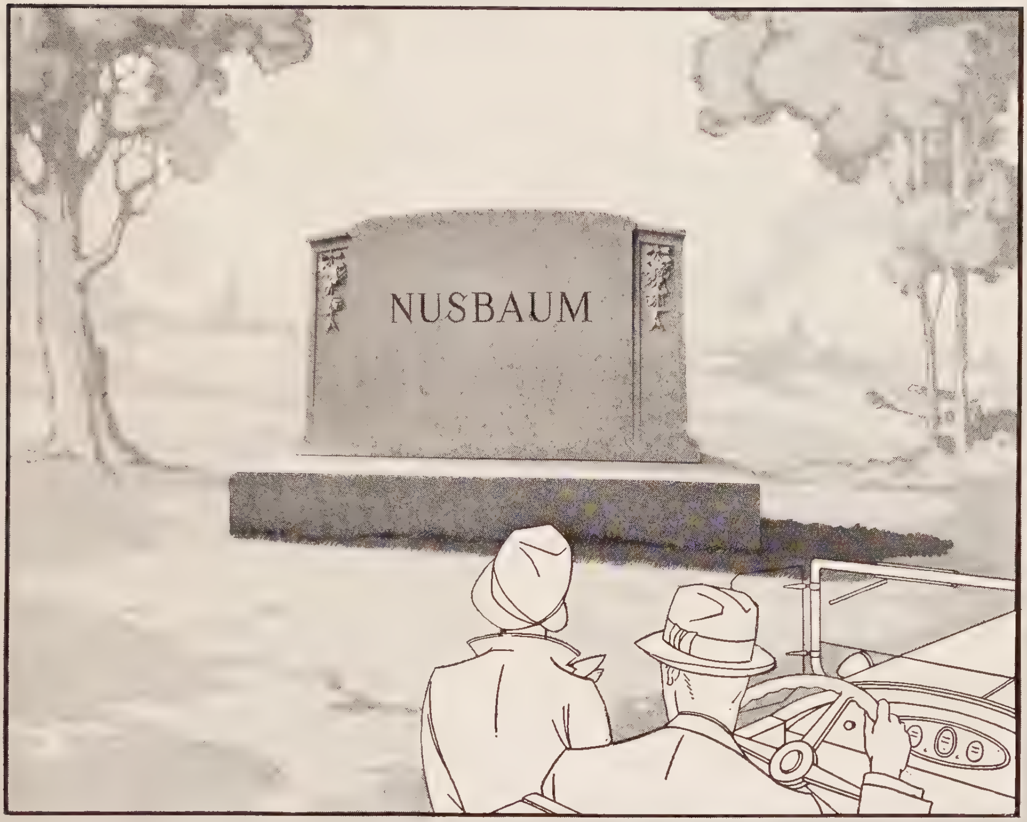

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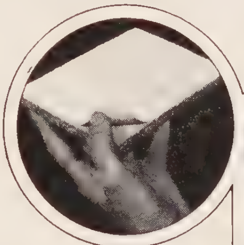

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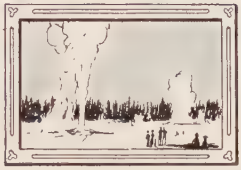

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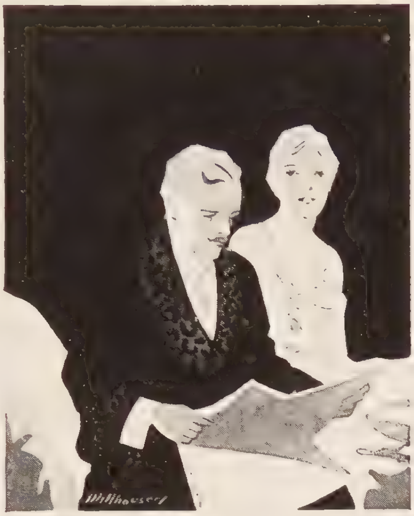

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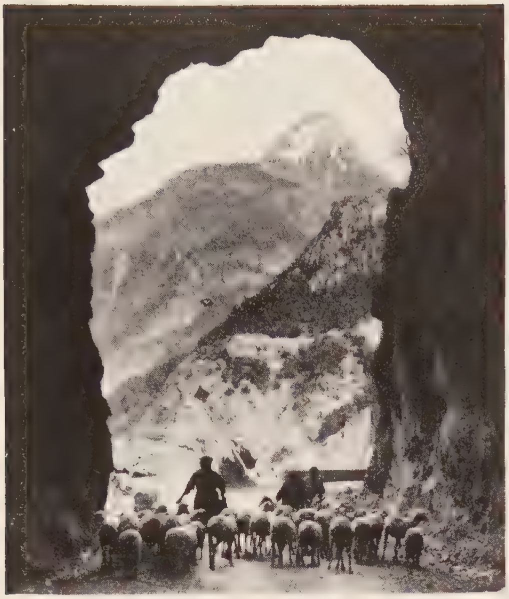

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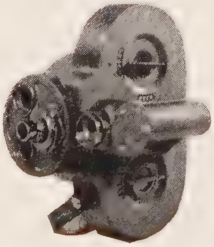

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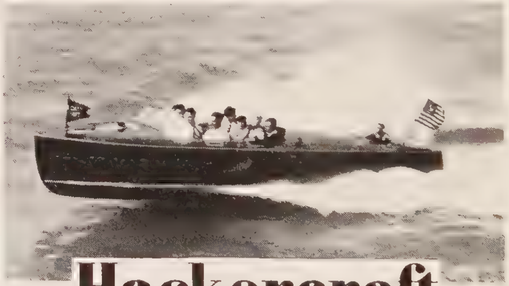

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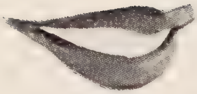

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WHEN you step from your dentist's chair with every tooth clean, and with gums which have the coral glow of health—then is the time to start using Forhan's.

This dentifrice gives the health of the mouth double protection—for it helps to safeguard the gums as well as the teeth.

When R. J. Forhan, D. D. S., was a practising dentist, he perfected a preparation for his own use in treating pyorrhea. The reputation of this treatment spread until it was used by dentists everywhere. Then the question naturally arose, "Patients need the daily benefits of this preparation—why not make its advantages a part of their hygiene in the home?"

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Any mouth may have pyorrhea and at forty the odds are

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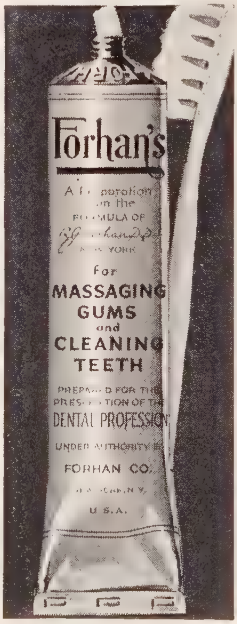

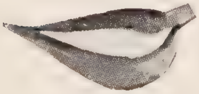

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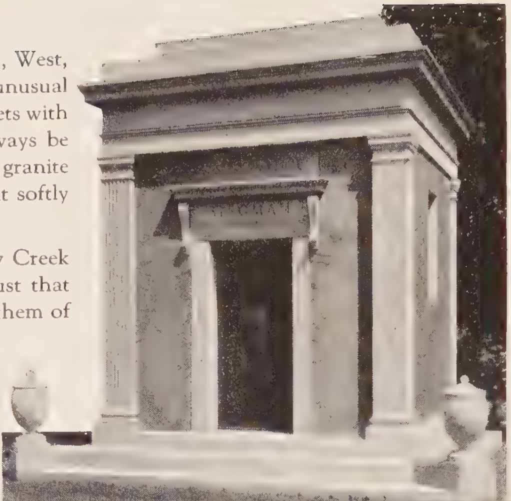
If interested, write for the helpful booklet, "Modern Memorial Art," sent free on request.



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Prevent in time

Long hours of undisturbed sleep at night and periods of rest during the day help to ward off tuberculosis in later years.

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THE tuberculosis deathrate has been cut in half in the last twenty years largely by better living conditions among the working population and the successful treatment of active cases. Now medical science has an even more brilliant victory in its grasp—the checking of the disease in children before it develops.

Children who come in frequent contact with anyone who has active tuberculosis are in grave danger, though they may look the picture of health and have none of the familiar warning signs — underweight, a cough, fatigue and poor digestion.

A large number of deaths from tuberculosis occur between the ages of 25 and 45. Yet in most of these cases the disease began in childhood, though there may have been a re-infection at some later time.

Contrary to the old-time belief, heredity does not plant the germs. Close contact with the disease in active form is usually responsible. The disease may lie dormant for many years and then flare up and become active following physical or mental strain, too heavy or too prolonged.

But there is no need to guess whether or not a child who has been exposed has picked up the germs. Modern science can now discover whether any damage has been caused by them. No longer are doctors compelled to rely merely upon such tests as tapping the chest, listening to the breathing, examining the sputum. They can be reasonably sure of correct diagnoses by including X-ray and tuberculin tests. Results from tuberculin tests are especially significant in children.

All children should be kept away from people who have tuberculosis. They should have regular, thorough physical examinations. If tuberculosis is discovered, modern restorative methods should be applied immediately.

Every child, no matter how healthy or sturdy, needs plenty of sleep, plenty of proper food, plenty of sunshine and fresh air. But the child who has picked up the germs of tuberculosis and is beginning to react to them needs additional care and a scientific health-building program under wise medical direction.

The Metropolitan Life Insurance Company will gladly mail, without charge, its booklet, "The Care and Prevention of Tuberculosis", to anyone who requests it. Ask for Booklet 430-N.

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Vol. LVII, No. 4 WASHINGTON April, 1930

THE
NATIONAL
GEOGRAPHIC
MAGAZINE

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LOUISIANA, LAND OF PERPETUAL ROMANCE

By Ralph A. Graves

Author of "The Granite City of the North," "Through the English Lake District Afoot and Awheel," "Marching Through Georgia Sixty Years After," etc., in the National Geographic Magazine

With Illustrations from Photographs by Edwin L. Wisherd, Staff Photographer, and a Special Map Supplement of Louisiana

"WHERE are we?"

"At the Promised Land."

A few moments before, the name of this thriving plantation would have had a sinister suggestiveness, for we were flying directly over it when the motor of our seaplane disintegrated and we began to hurtle toward the muddy waters of the Mississippi. As it was, once safe ashore, surrounded by a horde of curious pickaninnies who had aided us in towing our helpless plane to the levee, "The Promised Land" seemed to provide the text for a survey of Louisiana.

A PANORAMIC SURVEY

Within the bounds of this unique Commonwealth—the nucleus of that vast territory which when purchased a century and a quarter ago practically doubled the area of the United States—one finds a variety of resources, an equableness of climate, a tranquil scenic beauty, and a hospitality which make the manifold claims of her citizens as to their State's points of excellence seem a bare recital of obvious facts.

A subtropical land as the Nation's fur-producing center, providing coonskins for college boys, mink and opossum for milady; shrimps and strawberries, oysters and oranges, sugar and salt, terrapins and fiery tabasco, rice and red snappers, figs and frogs' legs, produced in staggering quantities for home consumption and northern markets; millions of waterfowl, with muskrats as game wardens; timber and turpentine; cucumbers and cattle; sulphur and Spanish moss; oil and gas flowing from seemingly inexhaustible subterranean chambers; cemeteries above ground and giant cypresses springing from swamps; North America's greatest river, bearing on its muddy breast to the South's greatest city, which it overhangs, vast and heterogeneous cargoes, including 23 million bunches of bananas each year, coffee for every third cup consumed in the United States, more mahogany and sisal than enter any other port, and, through that city, to foreign lands all the varied products of farm and factory originating in the Mississippi Valley—these are but a few of the contrasting pictures which flash before the mind's eye in a panoramic glimpse of Louisiana.

NEW ORLEANS, PART AND PARCEL OF LOUISIANA

"I have given England a rival," said Napoleon when, in 1803, he signed the sales agreement transferring to the young American Republic, for $15,000,000, an empire of 827,000 square miles, comprising the Louisiana Territory. Only a little more than a twentieth part of that terri-

PALMS FRAME THE SKYLINE OF NEW ORLEANS, CITY OF MODERN ROMANCE

Where once stood a small city of French and Spanish houses, there now rises a modern city of skyscrapers, whose proud claim it is that the Mississippi River and its many navigable tributaries lead to the port, thus tapping the resources of 27 States, comprising nearly two-thirds of the land area of the country and producing more than two-thirds of its wealth.

tory retains the original name, but what a share it represents in the wealth, the commerce, and the romance of the Nation!

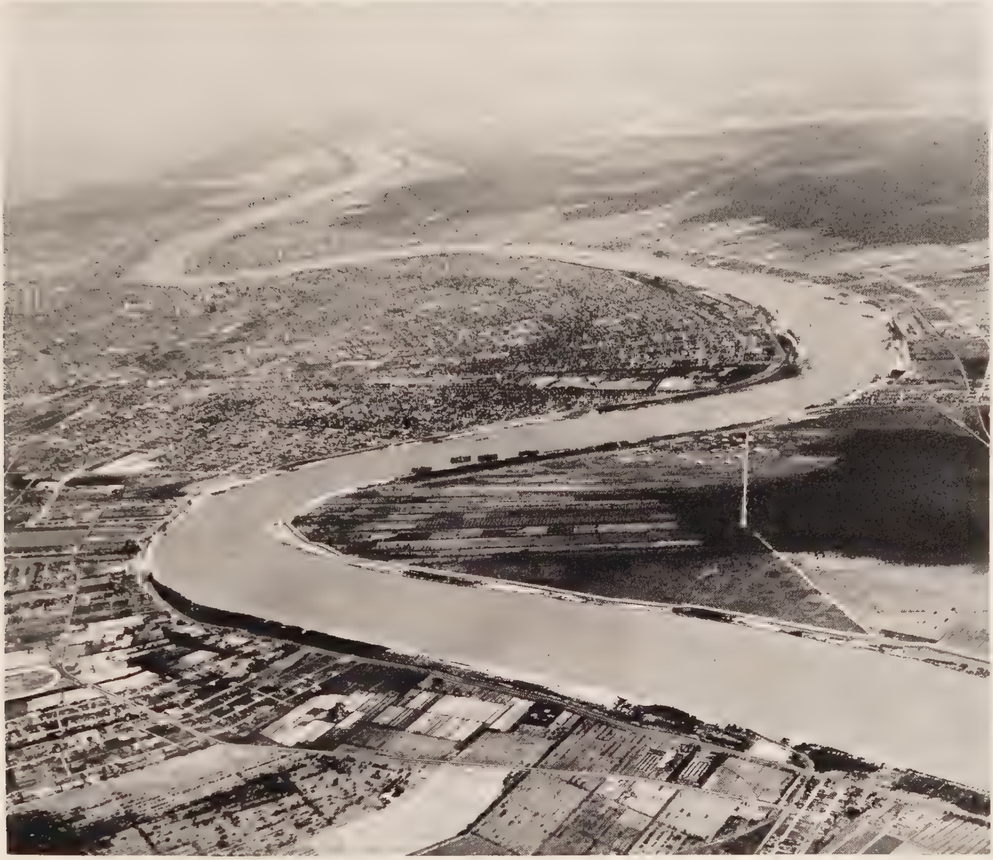
Although the genius of O. Henry has flared in brilliant rebuttal of the assertion, many writers agree with Frank Norris that New Orleans is one of only three great "story cities" of America. And New Orleans is part and parcel of Louisiana.

Nor does one need go back to the adventurous times of those daring French pioneers, La Salle, Bienville, and Iberville; to the days of those picturesque and honored pirates, the Lafitte Brothers and Dominique You; to quadroon balls, voodoo rites, suicide and dueling oaks, or even to the fantastic revels of this year's Mardi Gras, to find romance here.

To-day in Louisiana the visitor encounters romance as readily in any one of the half score 15- to 20-story office buildings of New Orleans as he did formerly in the city's "haunted houses," absinthe bars, or charming patios rich in association with the names of Lafayette, Louis Philippe, Adelina Patti, Jenny Lind, Audubon, Paul Morphy, and Lafcadio Hearn.

RIDING TO MODERN ROMANCE IN AN ELEVATOR

We mount to modern romance in an elevator. The scene is a dimly lit, one-



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THIS GREAT BEND IN THE MISSISSIPPI GAVE NEW ORLEANS ITS NAME OF CRESCENT CITY

The peninsula in the foreground is Ninemile Point. On the companion peninsula, farther down stream, near the top of the picture, is Algiers, one of the numerous industrial suburbs located on the right bank of the river (see map supplement). The open space visible in the city proper is Audubon Park and its continuation into the campuses of Loyola and Tulane Universities. The white rectangle opposite Ninemile Point is the water purification plant. The white loop in the left foreground is a part of the Jefferson race track.

man office. Before a littered desk sits a shirtsleeved, bespectacled individual continuously lighting a dormant cigar. He is one of the principals in the absorbing drama of Louisiana Sugar.

With her hundreds of thousands of acres of level fields, composed of the rich silt brought down through the ages by Father Mississippi, Louisiana is, of course, primarily an agricultural State, and for more than a century one of the chief among her many money crops has been sugar cane. It was the then French colony's own pioneer planter, Étienne de Boré, who, on his plantation, which is to-day a part of Audubon Park, New Orleans, developed a process for the manufacture of granulated sugar, and thus gave the New World a new industry.

For decades Louisiana's great sugar mills, set down in the midst of billows of green cane extending to the horizon, had unfailingly ground out wealth to the State's sugar barons. Three hundred thousand tons of sugar was not an unusual year's yield from the fecund black soil.

Amid this sunshine of prosperity, the proverbial cloud no larger than a man's hand appeared on the horizon in 1919 in the form of a pamphlet written by the foremost cane expert of the United States Department of Agriculture. "Beware, and prepare," it said in effect, "for the dread mosaic disease."

It was a voice crying, not in the wilderness, but in fields of flourishing cane, and prosperous planters, with one exception, heeded not.

For several years all continued well; then suddenly the predicted blight appeared. The mysterious mosaic disease, so called because of the curious mottling patterns which it produces on the cane leaves, swept over the land.

By 1926 the yield had dropped to 42,500 tons of sugar. Planters were desperate, bankers were sympathetic but obdurate. The fortunes invested in the sugar mills and in plantation equipment were "frozen assets," and there seemed to be no possibility of a thaw.

Manufacturers, bankers, and planters gathered in conference. How could the Louisiana sugar industry be saved?

The answer to that question is one of the romances of science.

For our first act, we must go back 40 years, to a sugar plantation on the island of Barbados, in the West Indies, and to an experiment station in Java, in the Dutch East Indies.

In 1887 two Englishmen in the West and a Dutchman in the East, working independently, succeeded for the first time in growing sugar cane from seed. Hitherto the only method of propagation had been from the stalks; but when it was found possible to make the seed germinate, the problem of cross-breeding was solved. Some authorities are so bold as to maintain that but for this successful step the sugar-cane crops throughout the world would be in danger of extinction to-day. But cross-breeding has enabled experiment stations to develop a countless variety of canes with innumerable characteristics—some which flourish under one set of conditions, others which are immune or resistant to this or that disease.

A CRYPTIC FORMULA BRINGS SALVATION

While the three Louisiana groups vitally interested in the salvation of sugar were in desperate conference, some one recalled that a certain agricultural scientist had recently returned to the United States after spending several years in Argentina, where he had gone to study ways and means to combat the mosaic disease. This blight had almost destroyed South American cane fields before its ravages began to be felt in Louisiana. The groups sent for the scientist—the shirt-sleeved, bespectacled individual of the one-man office in the New Orleans skyscraper.

Yes, there was salvation, said Mr. Scientist. It was at hand; the formula was simple—P. O. J. 234, P. O. J. 36, P. O. J. 213.

And what might these cryptic symbols, this abracadabra, mean? asked the bankers. One of the planters knew—the exception among all those who had failed to heed the Washington expert's warning. Five years before, he had gone to the National Capital and asked that expert what he could do to forestall the day of disaster in Louisiana. The expert had said, "Take these three stalks of a new variety of cane which I have obtained from Java, plant them, make them multiply; they are immune to the mosaic disease."

Those canes of the variety P. O. J. 234 thrived and the foresighted planter obtained from the Government expert two additional varieties, P. O. J. 36 and P. O. J. 213.*

JAVA CANE SUPPLANTS NATIVE VARIETIES

These canes had all lived and multiplied and a few samples had been given to neighbors. Despite the fact that the P. O. J. fields were struck by a terrible cyclone, which leveled the canes to the ground, they quickly revived and produced fourteen and a half tons of cane to the acre, whereas the general yield of native cane in normal times was seven tons.

To-day, every man, woman, and child in the cane belt of Louisiana knows the meaning of P. O. J. Instead of the technical name, Proefstation Oost Java (a sugar-cane experiment station in the East Indies), they may call it "Pride of Java," or, colloquially, "Plenty of Jack," but they all know that it has meant the salvation of the sugar industry. Among its advantages over the old native cane are its greater resistance to disease and frost; its greater sugar content; its tougher fiber; its

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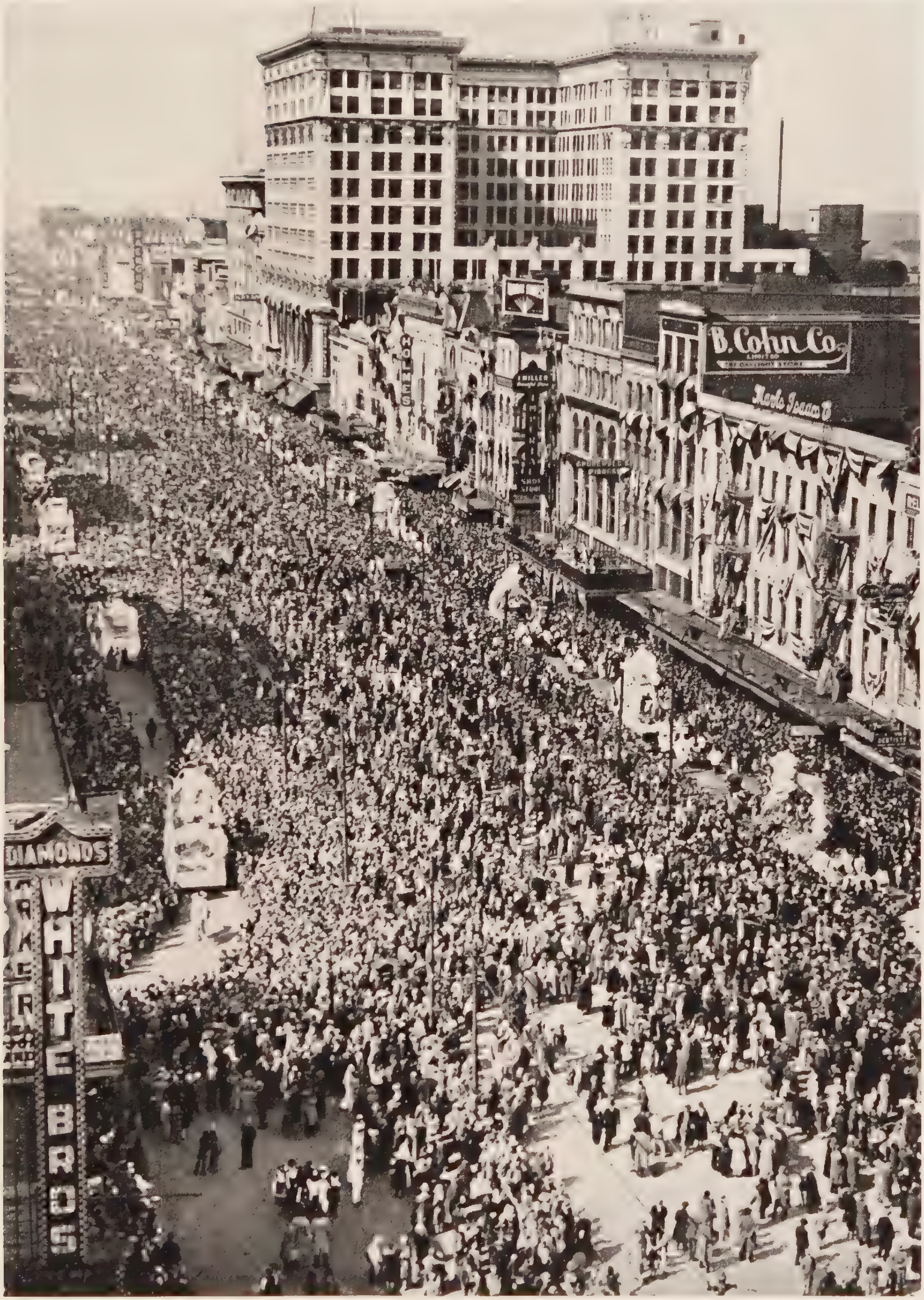
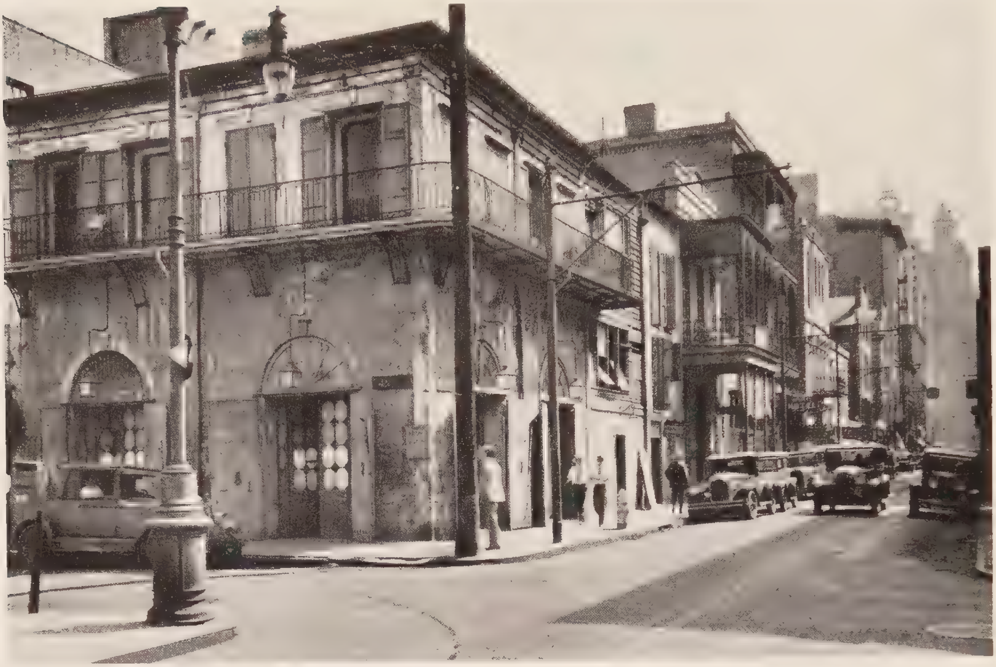
* See, also, "Into Primeval Papua by Seaplane: Seeking Disease-resisting Sugar Cane," by E. W. Brandes, Ph. D., in the NATIONAL GEOGRAPHIC MAGAZINE for September, 1929.



Photograph by W. J. Sadlier

MARDI GRAS CROWDS THRONG CANAL STREET AS ELABORATE FLOATS PASS IN PROCESSION

A newly surfaced and brilliantly lighted Canal Street greeted Mardi Gras celebrants this year. With a width of 171 feet between building lines, New Orleans proclaims this "the widest business thoroughfare in the world." The improvements just completed were effected at a cost of three and a half million dollars. The illustration shows the 1929 crowds.



THE OLD ABSINTHE HOUSE NOW LOOKS UP TO A NEW AND MODERN CITY

In the secret half-story above the ground floor of this crumbling structure in the French Quarter of New Orleans, those most venerated of pirate brothers, Jean and Pierre Lafitte, were accustomed to conceal their smuggled goods before they became patriots and lent assistance to Andrew Jackson's troops against the British in the Battle of New Orleans. Although a reward of $1,000 was offered for his capture, Pierre walked unmolested about the streets of New Orleans until he and Jean received a pardon from President Monroe.

ability to withstand heavier windstorms, and, finally, its growth from stubble, so that the farmer need plant his crop only every second or third year instead of annually.

The native cane has practically passed from the picture. In 1926 there were less than 1,000 Louisiana acres planted in the P. O. J. canes; in 1929 practically the entire cane area—200,000 acres—was in these new varieties, and the harvest for 1929 showed a yield of eighteen and a half tons of cane to the acre, as opposed to seven tons of the old, and the new cane yields 160 pounds of sugar to the ton instead of 138 for the old—three times as much sugar from the acre planted in the new cane as from the old native cane.

And all because the bespectacled scientist, fortified in his arguments by the success which had attended the pioneer experiments of the progressive planter, was able to persuade other planters to grow P. O. J. canes, which had been introduced in America by the Washington expert, and because bankers agreed to extend credit to those planters who would abandon the mosaic-diseased native canes and follow the lead of science!

Plumes of smoke rising from scores of sugar mills throughout southern Louisiana are a portent of restored prosperity to a major industry.

THE MISSISSIPPI AND ITS UNIQUE DELTA

But the major romance of Louisiana is to be found not in its cane fields. The progenitor of those fields, and of the entire State, is the Father of Waters.

To obtain a comprehensive picture of the mighty Mississippi in the last hundred miles of its 2,500-mile pilgrimage to the sea, I attempted a seaplane flight over the second oldest airplane mail line in continuous operation in the United States, from New Orleans to Pilottown, at the Head of Passes.

MANY OF NEW ORLEANS'S PAVING STONES CAME FROM EUROPE

Because the region round about the Crescent City is composed of alluvial soil, there is no paving material close at hand. More than a hundred years ago the city offered a bounty to ships which would bring to the port rock ballast instead of sand. The first cobblestone pavement was laid in New Orleans on Gravier and Magazine streets in 1817.

I pretend a certain superiority to superstition, but having taken my seat on the last and thirteenth sack of mail stowed into the open cockpit of the plane on a Friday, the thirteenth, and having come scudding to earth with a dead motor some 25 miles south of New Orleans, I decided not to avail myself of the privilege of continuing with the mail an hour later, when a relief plane arrived at "The Promised Land" plantation. My subsequent survey of the mouths of the Mississippi was made from the substantial deck of the United States Army Engineer craft *General Humphreys,* with one of the Engineer officers as my mentor.

What an experience! With its long, tenuous fingers of silt thrust far out into the Gulf of Mexico, the "bird's-foot" delta of the Mississippi is unlike that of any other major river on the globe. Between its fingers or claws are shallow, open bays, and the banks confining the great streams into which the river divides at Head of Passes, 95 miles below New Orleans, are in some places only a few feet in width.

In colonial times, when 10 or 12 feet of water provided ample depth for all caravels of commerce, navigation of the main passes of the Mississippi presented no difficulties, but with the increase in the tonnage and draft of vessels the shallow finger channels were a bar to progress and prosperity.

EADS SOLVES THE MISSISSIPPI CHANNEL PROBLEM

Ninety years ago the Federal Government made the first appropriation for deepening these natural channels, and in the course of the next 40 years it succeeded, by means of crude dredging processes, in increasing the depth to from 12 to 20 feet. But when it is recalled that in time of flood the Mississippi brings down for deposit at its mouths more than two million tons of sand a day, one can realize that this was a costly and disheartening battle.

By 1870 vessels had so increased in size and draft that a deeper channel became a crying necessity. A board of eminent

THE CONCRETE TOLL BRIDGE ACROSS LAKE PONTCHARTRAIN IS NEARLY FIVE MILES LONG (SEE, ALSO, ILLUSTRATION, PAGE 482).

THE SHRIMPING FLEET IN BARATARIA BAY

After the day's work of trawling for shrimp in the Gulf of Mexico, the sturdy luggers huddle around the buyers' boats, distinguished by the flags flying. They will all anchor tied together here for the night and start at sunrise in the morning for another day's work (see, also, text, pages 418-427).

SUGAR CANE AS FAR AS THE EYE CAN SEE

The luxuriance of growth of the new P. O. J. varieties of cane is indicated by the fact that the man in the center of the picture is sitting on a horse. Sugar cane ranks next to cotton and rice in the value of the agricultural crops of Louisiana. The 1929 crop produced 208,000 tons of sugar, compared with the 42,500 tons in 1926, when the mosaic disease had brought the crop to its lowest ebb (see text, pages 396 and 398).

LOUISIANA'S FIRST SUGAR BOWL

The inscription reads: "This is the kettle used by Étienne de Boré, the father of the sugar industry in Louisiana, when he first succeeded in granulating sugar, in 1795, on his plantation above New Orleans, now Audubon Park." The kettle now serves as a monument on the old campus of the Louisiana State University, in Baton Rouge (see, also, text, page 395).

engineers, appointed to find a solution of the problem, made exhaustive studies of many important harbor entrances, including the mouths of the Danube, which had been successfully improved by means of contracting jetties similar to those now in use on the Mississippi River. The board finally reported that the use of jetties would be too costly for the improvement of the mouths of the Mississippi and recommended the construction of a ship canal from Fort St. Philip (opposite Fort Jackson) to the Gulf.

At this juncture there appeared before Congress an engineering genius who persuaded that body to defer for the time being the digging of the ship canal and permit him, on a basis of "no cure, no pay," to attempt to provide and maintain a deep-water channel in his own way.

But when Congress finally accepted this "can't lose" proposition of James B. Eads, who had just completed the world-famous steel-arch bridge over the Mississippi at St. Louis, the engineer was not permitted to use the Southwest Pass for his experiment, as he had specified. This was the best of the three main passes, and the Government was taking no chances with Mr. Eads and his chimerical proposition! If he wanted to lose his own money, he could sink it in South Pass without endangering the then best channel.

The Eads contract called not only for a channel 26 feet deep and 200 feet wide at the bottom, but for maintaining that depth for 20 years.

With tremendous energy and rare organizing ability, the engineer set to work, and in less than five years his jetties and his dredges had done the work. And, furthermore, he maintained the depth for 20 years, that period expiring in 1901.

A HIDDEN FORCE KEEPS THE BARS CLEAR

One of the most interesting phases of the Eads undertaking came to light only a few years ago, long after the great engineer's death. Present-day engineers have learned that, while the master mind scored a notable triumph, his work was actually

MAN'S EFFORTS NEVER CEASE IN BUILDING AND REBUILDING THE MISSISSIPPI LEVEES

Notice the proximity of the houses to the left. If the river swings again in their direction, they will go. These operations are being conducted near Convent, midway between New Orleans and Baton Rouge.

saved by a force of Nature upon which he had not counted and of which, in fact, he was entirely ignorant. His scheme was based upon the theory that, by confining the flow of the Mississippi by narrowing jetties, he would make the stream itself keep the channel "scoured out." This is true—in part.

Eads found that beyond the mouth of South Pass he could maintain with ease a deep channel into the Gulf, provided he did not attempt to carry that channel straight out from the jetties, but at an angle of forty degrees to the eastward from the prolonged jetty axis.

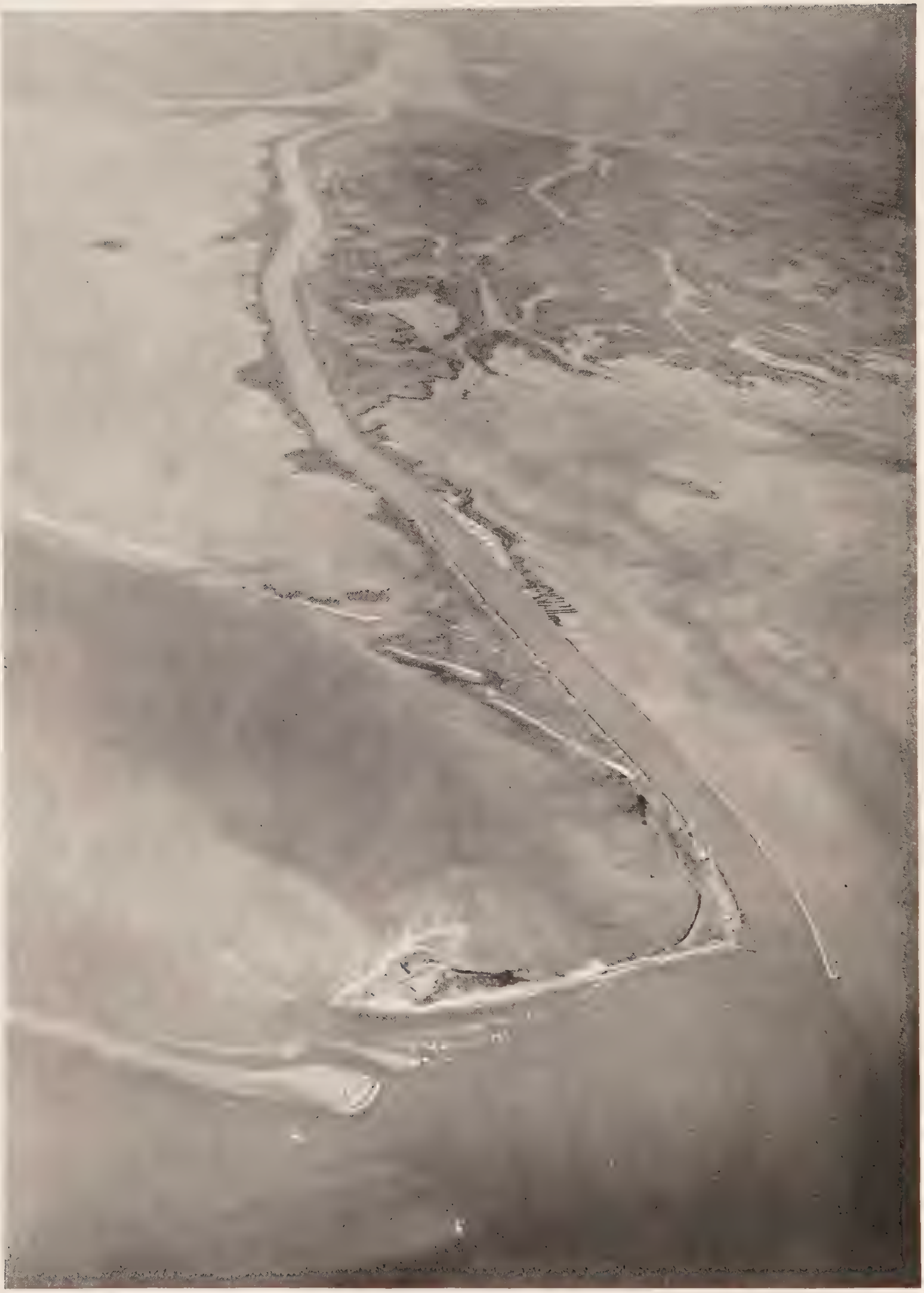
No explanation for this phenomenon was forthcoming until several years ago, when the Army engineers, in their work of improving Southwest Pass by the utilization of the Eads jetty system, ran into the same difficulty of maintaining a straight channel into the Gulf.

In 1921 a series of observations of surface and subsurface currents was undertaken with special meters. It was discovered that, although the surface currents entering the Gulf were flowing outward and spreading in all directions, there was, at 10 to 30 feet below the surface, an inflow of sea water in the channel proper. Since the Gulf currents flow from east to west, this salt water inflow was found only on the east side of the jetty axis.

This inflow extended as far upstream as the lower ends of the jetties and at times even farther. Where the inflowing sea current ceased, an eddy occurred. Whatever sediment tended to deposit in the outer channel was thus entrapped and brought back to the jetty, where it was caught in the eddy and was finally thrown out to sea to the west of the channel.

Thus the forty-degree channel is maintained *not by the scouring action of the outflowing fresh water,* as had been previously assumed, but *primarily by the inflowing salt water, which bears the deposits back to the river and finally casts them off to the west.*

This fortuitous salt-water current, which so magically lightened Eads's burdens, is believed to result from the difference in



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LOOKING UP THE MISSISSIPPI'S SOUTH PASS FROM THE GULF TO THE HEAD OF PASSES

The long white line at the right is a part of the Eads jetty system (see text, page 402). In the middle distance is Port Eads, headquarters for the engineering construction force which maintains the pass. Behind Port Eads is the shallow expanse of Garden Island Bay, which is gradually silting up and becoming swamp land (see text, opposite page). Note the narrow banks confining the main current of the great river. From the end of the jetties in the foreground to the Head of Passes, at the top of picture (Southwest Pass branching to the left and Pass a Loutre to the right), is twelve miles.

weight between salt and fresh water, the heavier salt water forcing its way under the fresh water. This phenomenon is now enabling the Army engineers, with a limited amount of dredging, to maintain a 35-foot channel, from 900 to more than 1,000 feet in width, with central depths of from 38 to 64 feet.

FIGHTING THE FATHER OF WATERS WITH PIN PRICKS

The main responsibility of the engineers to-day, so far as the mouths of the Mississippi are concerned, is to prevent the river from creating new passes. It is the natural tendency of the river to throw off a new branch whenever the pressure in the main stems is increased unduly, either by the normal lengthening process or through artificial constriction of the channel by jetties. A new branch results in the diversion of water, a decrease in the strength of the current, and a consequent decrease in the effectiveness of the jetty control.

One means of meeting this constant threat of a new branch is by creating artificially a number of miniature branches through the very narrow banks of the passes—inoculations, so to speak, to build up resistance. Shallow crevasses are cut through the banks, and the bottoms of these sluices are lined with brush mattresses covered with riprap stone to prevent deep channels from washing through.

Beyond these shallow crevasses, or spillways, brush dikes are constructed to retard the flow and accelerate sedimentation. In the course of time the sediment brought down by the river collects behind these retards, marshland is built up and is soon overgrown with cane, willows, and alligator grass.

Thus, banks which only a few years ago were less than 100 feet wide in many places, are gradually broadening, as the river does construction work for the engineers at one-tenth the cost of building retaining walls and pumping these full of muck.

A crevasse which occurred in 1891, in the south bank of Pass a Loutre, affords a striking example of how rapidly this natural process operates. The crevasse opened through a narrow section into Garden Island Bay. By 1905 Master Engineer Mississippi had built out swamp land for a length of six miles, and an area of fifty square miles beyond the original crevasse is to-day covered with swamp growth.

Incidentally, Cubits Gap Pass furnished the notable object lesson by which our engineers have profited. There was no such pass prior to 1862, when Admiral Farragut had a small ditch cut through the river bank for the launching of small boats into the shallow bay in rear, in order that he might run down privateers.

As there was no impeding bottom of riprap stone, the current began to gouge out another great passage to the sea. To-day Cubits Gap (so named after a Confederate sympathizer who lived near by and who was arrested by Admiral Farragut for giving information to privateers) has a width of nearly half a mile, where it debouches from the main current; it has a depth of 40 feet at some points, and the tongue of land it has built out to the east is eight miles long—all directly traceable to the digging of a small ditch.

THE FUR WEALTH OF LOUISIANA'S MARSHES

It is not only the Mississippi which makes Louisiana "water-minded." The State is threaded and meshed with bayous, lakes, and streams, giving it more than 4,790 miles of navigable waters—a total which exceeds by two for one its nearest competitor in the Union, Arkansas.

Naturally, much of the bordering land in the vast delta region is marsh area; but let no casual observer be deceived into imagining that "marsh" in Louisiana means waste or unproductive land. It is these tens of thousands of grass-covered acres which have given the State the unique distinction of being the largest fur-producing Commonwealth in the Union. As a matter of fact, not only does Louisiana lead all other States both in the value of its fur crop and in the number of pelts marketed, but last year, and for several years past, it has produced more pelts than the entire Dominion of Canada, generally recognized as one of the world's most important fur-producing countries.

The muskrat is the fur citizen mainstay of the State's pelt wealth. More than five million of him were taken during the open season from November 20 to February 5, 1928-29. The statistics for this year are not yet available, but the catch was as large if not larger. The value of those pelts to the trapper was nearly $6,000,000.

The Louisiana trapper was practically unknown to the outside world until the disastrous Mississippi flood of 1927 brought him into the limelight. In the early appraisals of that disaster some alarmists declared that high waters had destroyed the livelihood of from 12,000 to 28,000 muskrat men. Happily, not only did the muskrat families survive, but the opossums and skunks of upper Louisiana, who were supposed to be even worse sufferers, thrived on water woe; more opossums were trapped last year than in any previous season.

What with muskrats, opossums, raccoons, minks, skunks, otters, wild cats, and foxes, the trappers' sales last year aggregated eight and a half million dollars—exceeding by a third the total value of Alaska's production of gold and silver for the same period.

THE STATE RECRUITS ITS TRAPPER ARMY FROM THE CAJUNS

Houma, in Terrebonne Parish (parish corresponding to county in other Commonwealths), styles itself the fur capital of the United States. It is a brisk, prosperous little city, with shrimp, oyster, and fish-packing interests in addition to activities as an outfitting place for trappers. On its streets one rubs elbows with the famous "Cajuns" of the State, so named because of their presumable descent from those Acadians who were deported from Nova Scotia to this region in 1755, and who figure so prominently in Louisiana legend and literature, especially in "Evangeline."

The language of the Cajun is a French patois, but occasionally he makes forays upon the English tongue, and weird and fantastic are the results. Although a vast deal of fun is had at the expense of the Cajun, chiefly on account of his linguistic lapses, Louisiana has leaned heavily upon his stalwart shoulders and he endures the hardships of the trapper's life with admirable bonhomie. He may, in excitement at the approach of a flock of birds, cry, "Here come four ducks—three by heself and one in a bunch," or, in boasting of his pet, assert, "My dog, he catch two rabbits ev'y day, sometimes one"; but he is a sound citizen, nevertheless.

TRAPPERS TAKE THEIR FAMILIES TO THE MUSKRAT MARSHES

By the middle of November the Cajun and other native trappers—no licenses are issued by the State to nonresidents—are ready for their arduous labors. They transport their wives and children to the marshes, set up their tiny huts, or convert rafts into houseboats.

In Terrebonne Parish the well-to-do trapper leases 800 feet of bayou frontage, with trapping rights extending a mile back into the marsh. For this holding he pays a season rental of $800. On November 20 he dons his hip boots and sleeveless jacket with capacious pockets and begins his harsh 75-day regimen, rising at daylight to make his rounds. He sets his traps about each muskrat nest, rising inconspicuous on the landscape as a small clump of dried marsh grass and twigs. The law forbids him to place them nearer than 10 feet from the nest. He uses no bait, but must depend upon his skill in setting the trap where the rat will pass on his way to and from his home (see page 413).

The newest type of trap has two jaws, the first to catch the foot of the rat and the second, more powerful, to whip over and crush the animal. This second jaw serves a double purpose: it kills the rat quickly, preventing prolonged suffering, and it insures against escape. One old trapper, explaining its operation, added: "One cold morning I found 26 paws in my traps instead of rats; if I had had this new trap, I would have had 26 rats."

There is a small fortune awaiting the inventor who will devise a satisfactory trap that will catch the rats alive, so that the "mice" (babies) and the "kits" (six to nine months old) can be turned loose to grow another year.

NEWS-BEARING FUR BUYERS MAKE DAILY ROUNDS

After his arduous round, the trapper returns to his hut or boathouse, flings his catch upon the table, his work done for the day. It is the job of his wife and children to skin and stretch the skins. When the pelts have been peeled off, with the

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AN AËRIAL VIEW OF THE MISSISSIPPI RIVER DELTA: LOOKING TOWARD THE GULF DOWN SOUTHWEST PASS

The width of Southwest Pass is two to three times as great as that of South Pass, where Eads's jetties proved so notably successful in maintaining depth (see text, page 402, and illustration, page 404). The work of the Corps of Engineers of the United States Army was not completed on this pass until July, 1923, since which time a channel 1,000 feet wide and not less than 35 feet in depth has been maintained with little dredging (see text, page 405).

fur inside, they resemble pointed buckskin bags (see page 408).

Boats and huts lined up on each side of a bayou in a populous muskrat district suggest a sort of "Venetian slums main street." Down the water lane each evening come the fur buyers in their launches. They bring the news of the day from civilization and dispense whatever items of gossip may have been picked up along other main streets.

Now and then one encounters a trapper who is not so improvident as the majority of his clan and who does not rush back to town to spend a large part of his season's earnings on a new automobile. He may have a well-equipped houseboat, with a phonograph, a radio, and a steel safe for his funds, the average price which he receives from the buyer being a dollar a pelt.

Such luxuries, however, are a rarity, except in the case of the men who trap a vast region of 170,000 acres in Cameron Parish, lying between Lake Sabine and Lake Calcasieu, southwest of the city of Lake Charles. This enormous territory, controlled by one individual, is being scientifically developed as a mammoth muskrat ranch. Ninety-five miles of canals, 16 feet wide and six feet deep have been dug here, providing easy access by water to

Photograph by Stanley Clisby Arthur

THESE MUSKRAT PELTS WILL AVERAGE A DOLLAR EACH

The skins are turned inside out and when dried resemble small rawhide bags. The trapper usually rents the land, on which he works with his family, for 75 days each year (see p. 406).

A SEVEN-FOOT ALLIGATOR CAUGHT IN THE CAMERON PARISH MARSHES

The alligator has been given a bad name by the fur trappers of Louisiana, among whom there is a saying that "every 'gator killed means the salvation of from 10 to 100 muskrats." But it is not solely for the muskrat's sake that these creatures are hunted relentlessly in the coastal parishes; their pelts are much sought after by manufacturers of ladies' slippers and purses. More than 36,000 alligator skins have been shipped from the State in a single year.

every part of the marsh, which has a maximum length of 29 miles, a width of 14 miles, and a frontage of five miles on the Gulf (see page 413).

Here permanent camps have been established and no women or children are allowed, as the owner does not relish the thought of interrupting children's schoolwork in midwinter.

Each camp is equipped with a radio; a physician makes regular rounds. An energetic trapper operating on this privately owned, privately trapped, and constantly patrolled marsh will average a net income of $1,000 for his season of 75 days.

THE MUSKRAT IS THE CONSERVATIONIST'S STRONGEST ALLY

The owners of muskrat ranches have learned that marshlands yield a large revenue. They are unwilling to jeopardize their value by granting permits indiscriminately to hunters, whose activities are apt to destroy muskrat nests and families.

A SEVEN-FOOT ALLIGATOR GARFISH CAUGHT IN BAYOU TECHE

Such enormous predacious fish abound in the waters of Louisiana and destroy many valuable food fishes. The flesh of the alligator gar is rank and tough and is seldom eaten.

In the light of these facts, one of the best-informed officials of the State's Department of Conservation maintains that the muskrat is the most effective single force now operating for the protection of wild life in Louisiana.

Louisiana needs the help of the conservationist muskrat, for while many other States of the Union have much greater acreages set aside as wild-life havens, none are more important as winter refuges for waterfowl.

Of its four Federal and eight State wild-life reservations, having a total of more than 320,000 acres, the three largest are the Rockefeller Foundation, the Russell Sage (Marsh Island), and the Singer. One of the most important is the Paul J. Rainey Refuge, administered by the National Association of Audubon Societies, which has been a pioneer in wild-life preservation in this field.

In addition to providing winter homes for countless waterfowl, the State is visited annually by millions upon millions of other birds in their migrations north and south. It leads the Union in the volume of its "bird traffic" (see pages 412-414).

Photograph by Edward A. McIlhenny

LIKE A JAPANESE SCREEN

This nesting colony of Louisiana herons in the willows on Avery Island is safe from molestation and is breeding rapidly (see, also, text, page 427).

Sixty-two miles due south of New Orleans lies Grand Isle, on the Gulf coast; it is a century removed from the Louisiana metropolis in point of atmosphere and traditions. There is no telephone, no telegraph, no radio communication save the United States Coast Guard's receiving set for storm warnings; mail comes only every other day.

It was my privilege to visit Grand Isle and its 400 French-speaking inhabitants as the guest of the "lord of the manor," so to speak, the New Orleans capitalist who has recently acquired the major portion of the island, which is from one-half to a mile in width and seven and a half miles long.

We came by motor boat down river, through canal, across bayou, and the entire automobile fleet of the island—a small truck and a touring car—met us at the little pier.

As we sped toward M'sieur Ludwig's congeries of buildings—store, hotel, warehouse, and terrapin pens—flocks of pelicans rose before us from the sandy beach and herds of semiwild cattle fled in every direction, as if they recognized in the automobile the symbol of their doom, for the new owner has announced that the island is no longer to be used as a free-for-all range; that the beach must be kept clean.

Whether or not the anti-cattle edict goes

Photograph by Stanley Clisby Arthur

A FUR TRAPPER DRIES HIS SKINS

More than five-sixths of all the fur pelts marketed from Louisiana are muskrat. The catch during the past winter season exceeded five million skins. The skins of opossums, raccoons, minks, skunks, "civets," foxes, and wild cats are also taken by the State's trappers, these contributing about $3,000,000 in value, compared with more than $5,800,000 contributed by the muskrat crop (see text, pages 405-6).

into effect without some show of passive resistance by the Grand Islanders, only the future will tell. The inhabitants have been raising cattle for more than a hundred years, and what are mere recorded deeds of ownership of unfenced land between a Grand Islander and his herd?

THE WORLD'S CHAMPION TERRAPIN FARMER

M'sieur Ludwig is one of those extraordinary characters whom one meets occasionally in a certain type of fiction, but so rarely in the flesh. He is the uncrowned "King of Grand Isle," but, even more important, he is the premier terrapin farmer of the world! From his pens go from 30,000 to 40,000 terrapins each year to delight the palates of the gourmets of the East and North. Maryland and Carolina terrapins may be larger and command higher prices, but for actual quantity production who can equal M'sieur Ludwig?

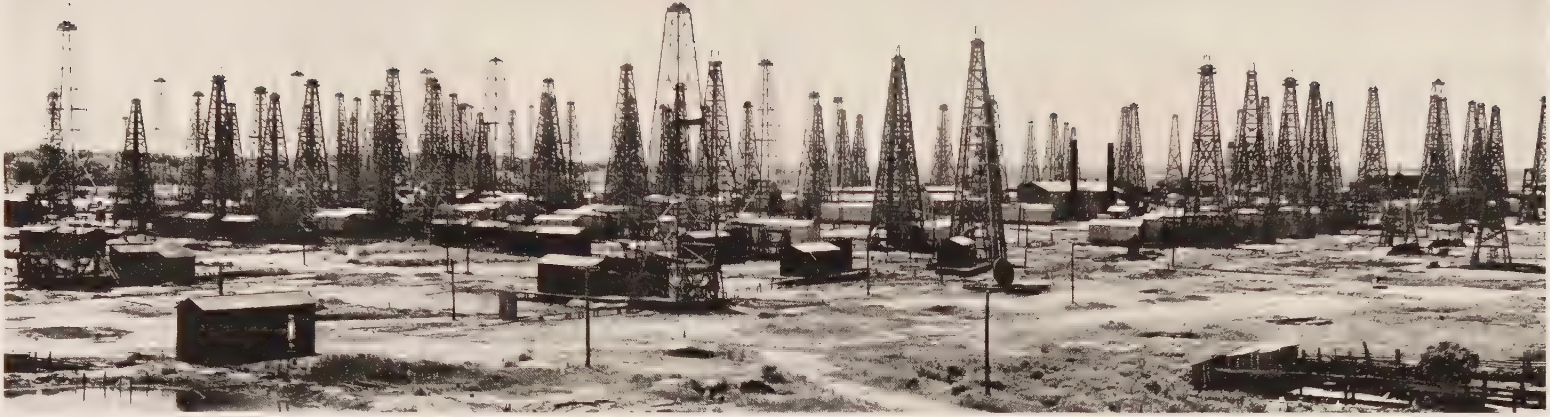
Not all the terrapins which stocked M'sieur's pens at the time of my visit were recruits from the near-by marshes. They had been shipped in to him by trappers from as far west as Brownsville, Texas, and as far east as Savannah, Georgia.

There was a time when M'sieur Ludwig had visions of operating a hatchery and nursery for his terrapins, but he discovered that it takes terrapins four years to develop to the point where the "bulls" can be distinguished from the females, and in that length of time the former eat up all possible profit, for the price which a terrapin commands is governed by its size. The bulls never grow to be more than 4½ inches long, a size which sells for from $3.50 to $4 per dozen in the New York wholesale market. Six-inch terrapins (females) are worth $24 per dozen. The Chesapeake Bay terrapins, which grow to 7 inches, bring as much as $68 to $70 per dozen.

Photograph by George Shiras, 3d

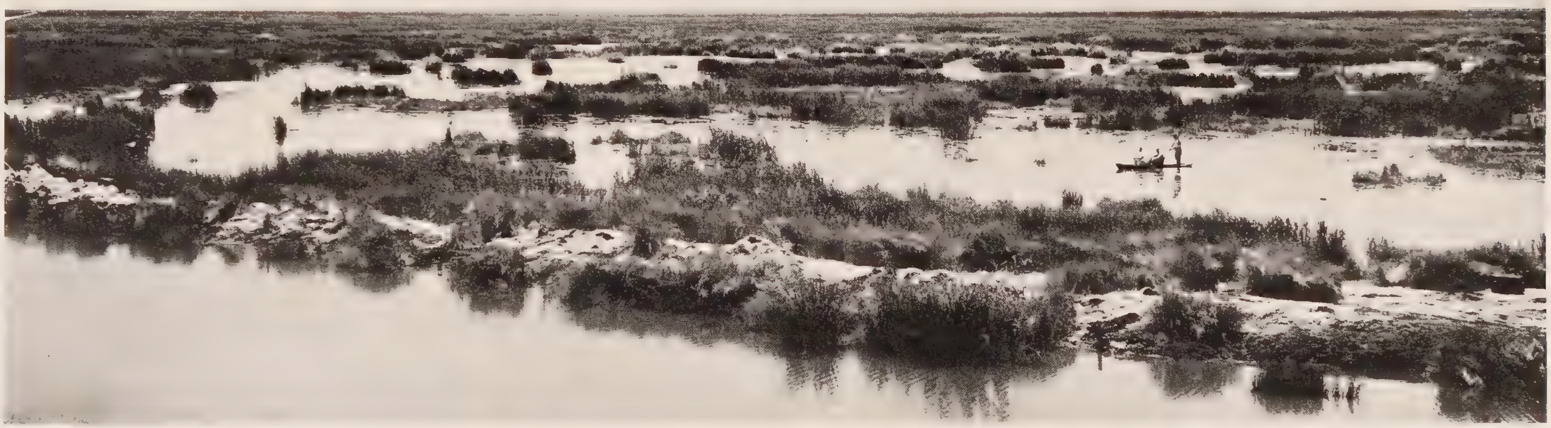
MALLARDS AND PINTAILS RISING FROM A FEEDING GROUND IN THE LOUISIANA MARSHES

Although these lowlands are primarily a resort for geese, many thousands of wild ducks also find sanctuary here, both from the rigors of a northern climate and the menace of the hunter's gun (see text, page 409). Although the delta duck potato and the banana waterlily supply them with much of their food, on some of the protected refuge areas they are also fed large quantities of grain.



A MAZE OF OIL DERRICKS AT GED, LOUISIANA

In addition to the fields at Ged, Calcasieu Parish, of which Lake Charles is the parish seat, has numerous producing wells at Vinton, Sulphur, and Starks.



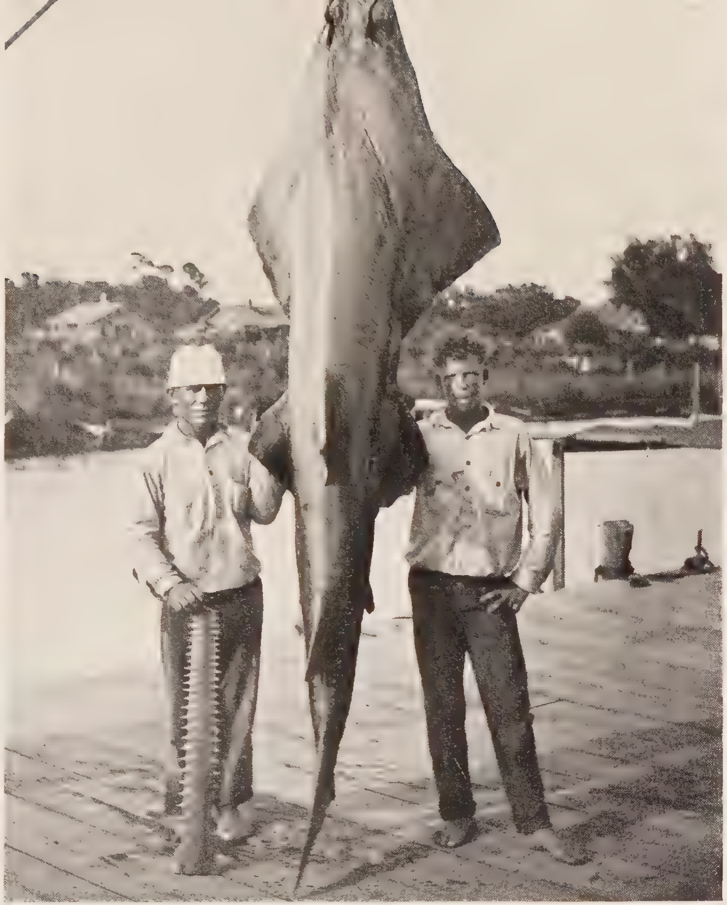
THE HOME OF THE MUSKRAT: PART OF A PRIVATELY OWNED RANCH OF 170,000 ACRES OF MARSHLAND IN CAMERON PARISH (SEE TEXT, PAGES 407-409)

Across the foreground runs one of the numerous canals which thread this scientifically operated fur farm. These afford the trapper easy access to the extensive territory which he must work and also provide a means of controlling the level of the water in the marshes.

Photograph by George Shiras, 3rd

BLUE GEESE ON THE RAINEY WILD LIFE REFUGE NEAR VERMILION BAY

Most North American waterfowl are widely distributed, but practically all of the blue geese in existence winter in the Louisiana marshes and breed on Baffin Island. The 26,000 acres of the Rainey Wild Life Refuge (see map supplement) constitute one of their favorite haunts. There they find in abundance the marsh grass on the roots of which they mainly subsist.



Photograph by C. E. Walter

A HUGE SAWFISH TAKEN OFF THE LOUISIANA COAST OF THE GULF OF MEXICO

This strange member of the ray family is abundant in the warm brackish waters of tropical and subtropical river mouths and estuaries, where its formidable weapon makes it master of many of the other large denizens. It has very inadequate teeth, and only by using its saw to slash and tear from its victims bits of flesh of a size easily swallowed is it able to lead a predacious existence.

AN ACADIAN DAUGHTER WITH A GARLAND OF MOSS PLAYS THE MIMIC

In the gardens of the more pretentious plantation homes of Louisiana were statues representing the seasons of the year. This is "Spring," in the garden of "The Shadows," at New Iberia, one of the loveliest of the ante-bellum estates, erected just a hundred years ago by David Weeks and now owned by a young artist, a fourth-generation descendant of the builder.

ST. FRANCISVILLE IS JUSTLY PROUD OF THIS MAJESTIC OAK

West Feliciana Parish, of which St. Francisville is the parish seat, is one of the principal cotton districts of Louisiana. Four miles from the town stands "Oakley," a plantation house built in 1808. Here John James Audubon, the great naturalist-artist, who was born at Mandeville, on the shores of Lake Pontchartrain, lived for several years while acting as tutor for the owner's daughter, Eliza Pirrie. Audubon taught Eliza and the neighboring children to draw, paint and music while Mrs. Audubon taught them dancing.

CLINTON'S COURTHOUSE IS CAST IN FAMILIAR MOLD

In front of the colonial portico stands the typical Confederate monument in commemoration of Civil War sacrifices.

Photograph by E. R. Gammage

DOCTORING A STATELY OAK

The hollow holds the football team of New Iberia in the Evangeline country, where such venerable forest giants are numerous.

M'sieur Ludwig's experience showed that four out of every five terrapins hatched were bulls, so he had his pens reconstructed with the palings sufficiently wide apart to permit the babies to escape into the marshes, where they find their own provender until they grow large enough to warrant the trapper in capturing them for the Terrapin King.

M'sieur Ludwig never ships his terrapins to the open market. He waits until he gets a specific order, for the "makings" of terrapin à la Maryland must reach the customer alive. They are taken from their pens, measured, and shipped tightly packed in barrels.

During the summer months 35,000 or 40,000 terrapins will consume as much as a ton or a ton and a half of fresh seafood a day. Fortunately for the terrapin farmer, they do not eat in winter—from October 15 to April 1. The market season is from the middle of September to the middle of April.

Some of the terrapins in M'sieur Ludwig's pens have been his guests for 28 years. They have evaded capture so long that they are now recognized as veterans and will doubtless never grace an eastern banquet board. But they will not be missed; lots of muskrat meat, sprinkled with artificial bones made of porcelain and decorated with hard-boiled hen's eggs cut into small balls, are eaten each season as "terrapin," and only the true epicure recognizes the imposture.

ONE MUST RAISE CUCUMBERS ON GRAND ISLE

Terrapins are only one of M'sieur Ludwig's interests. He runs the general store of the island, is the postmaster, the pharmacist, the confidant of the inhabitants, and the commission merchant who handles the produce of their fields, chiefly cucumbers and snap beans (see Color Plate II).

"The Grand Islander must raise cucumbers," said M'sieur Ludwig, as we chatted together one evening in that railed-off portion of his store which constituted his private office. "He may swear he will never plant another seed when he gets the returns from a shipment to a glutted market, but when the time comes, he *must* plant cucumbers. It is the tradition of the people.

"In good years we ship as many as 110 carloads of cucumbers (50,000 bushels), in bad seasons not so many—perhaps 75; but always we *must* raise cucumbers."

And the visitor ceases to marvel at the quantity when he sees with what scrupulous care each plant is nurtured with hoe and hand. Every hill is raked up to the same height and each group of plants is provided with its individual windbreak of loose straw. The Grand Isle farms look as if they might have been transported bodily from those vegetable plots cultivated with such infinite care and patience by the French peasants around Chartres.

There are no streets or lanes in this island community, and, so far as I was able to discover, only one road—that running from the pier to the Ludwig compound. The houses and vegetable patches are set down in higgledy-piggledy fashion, and when you go to call on a neighbor you simply climb through a hedge here, over a stile there, and watch your step with elaborate care when you come to a bean, cucumber, or tomato patch.

That life has not changed much in the last 50 years on Grand Isle was indicated by an incident which occurred one evening as I sat and watched the panorama of island commerce flowing through the door of the general store. One of M'sieur Ludwig's genial and stalwart young sons, who is an expert carpenter and capable foreman by day and a clerk behind the counter at night, came over to his father and made known the out-of-the-ordinary wants of one of the customers.

The proprietor rose and went across the store, rummaged for a while among boxes of soap and coils of rope, and finally brought out a keg, from which he doled out some clinking hardware. When he returned with a smile upon his face he explained: "That Cajun wanted a kind of nail for which I have not had a call since my father, who established this store, put them in stock in 1882."

PREPARING SHRIMP FOR THE ORIENT

On our way back to the twentieth century we paused at Manila Village, on Barataria Bay, one of the numerous shrimperies of southern Louisiana. Shrimp are taken in these waters at all seasons of the year, and, in addition to providing

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SPANISH MOSS FESTOONS AN ARBOREAL ARISTOCRAT

Magnificent live oaks are a conspicuous feature of the landscape in many of our Southern States. This venerable specimen stands before the homestead of an old sugar plantation on [illegible] Bayou in southwestern Louisiana. In order to put the living quarters above the reach of flood waters, the house is built on piles.

THROUGH A LAND OF ENCHANTMENT WINDS THE TRANQUIL CALCASIEU

From its source in Vernon Parish this beautiful tree-lined stream flows into the Gulf by way of Lake Charles and Lake Calcasieu. Its lower reaches traverse a still virgin region of forest and marshland which is one of the important wild-life sanctuaries of the United States.

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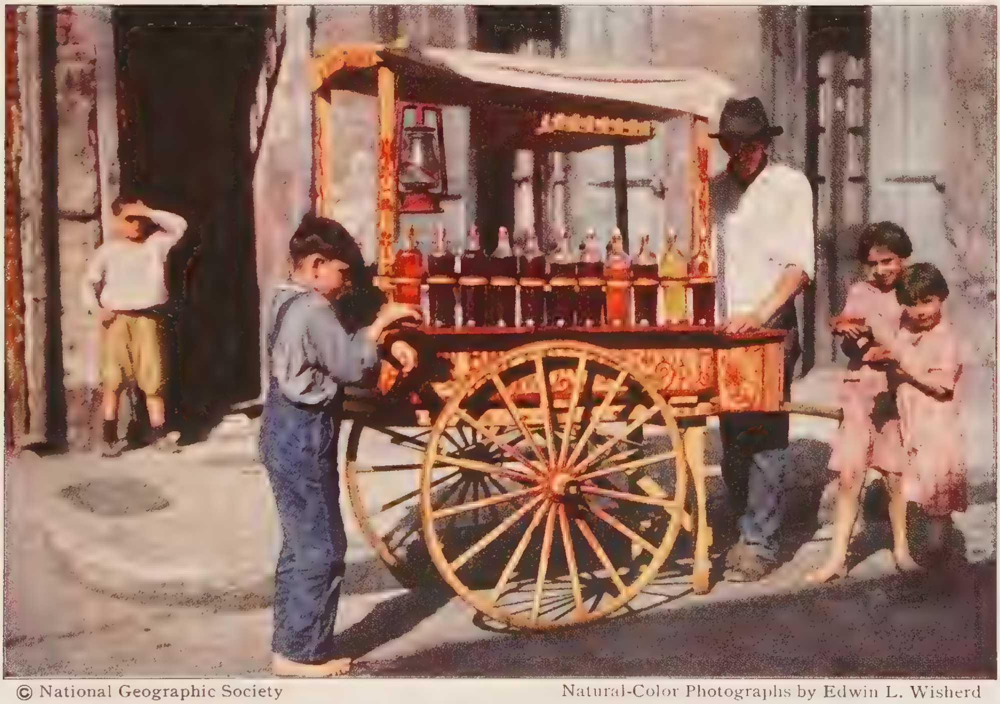
THE PRINCIPAL CROP ON GRAND ISLE IS CUCUMBERS

The 400 French-speaking inhabitants of this subtropical island on the Gulf coast are very successful truck gardeners.

PRODUCTS OF A LOUISIANA GARDEN NEAR MONROE

A mild climate, rich earth, abundant rainfall, and accessibility to a large market have combined to put the Pelican State to the fore among truck producers. Tomatoes, beans, cabbage, cauliflower, spinach, carrots and peas are a few of the vegetables grown for the winter market.



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THE "SNOWBALL WAGON" IN THE FRENCH QUARTER

These are the only "snowballs" the children of New Orleans have ever seen, as snow has not fallen there in fifty years.

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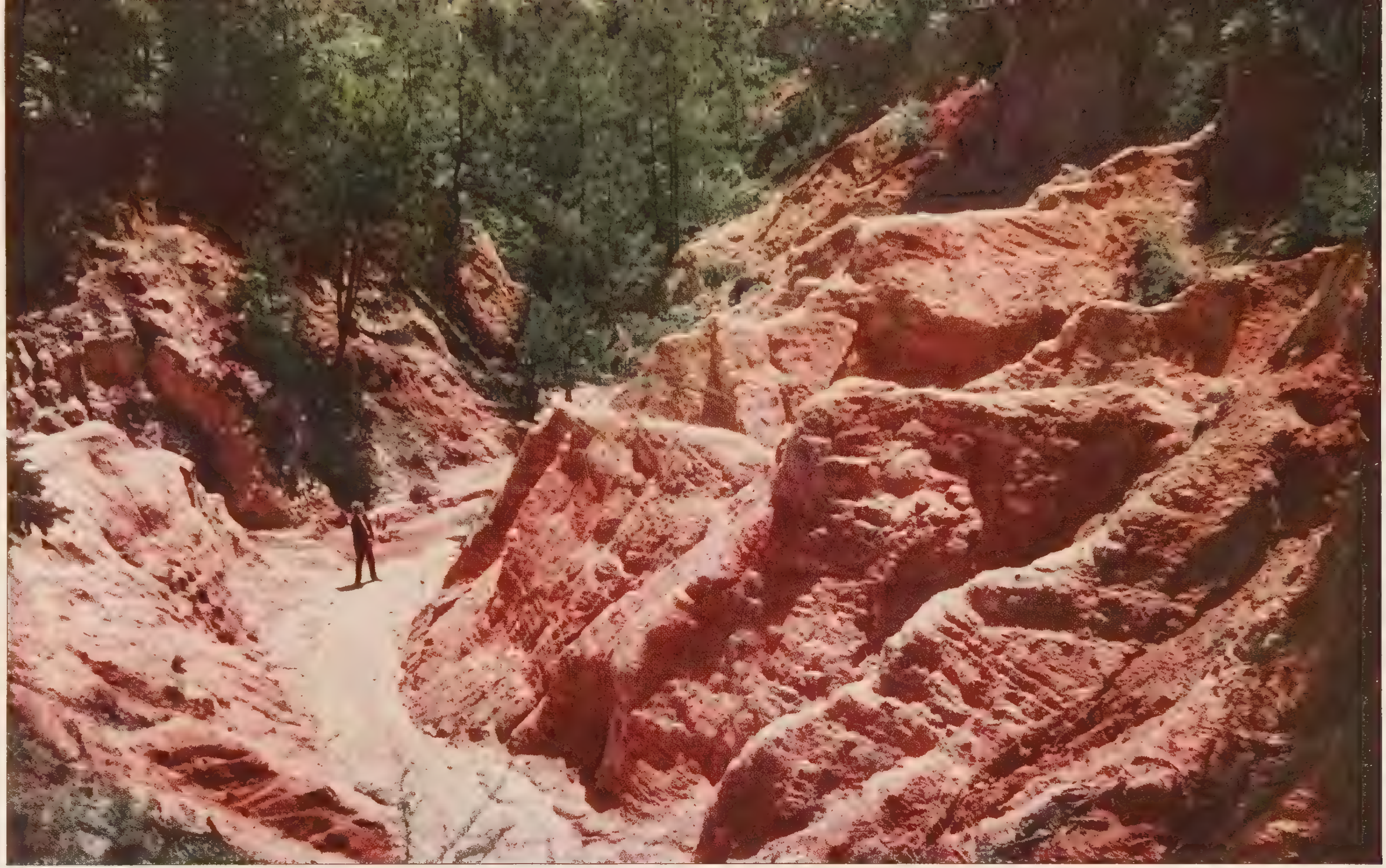
Natural-Color Photographs by Edwin L. Wisherd

FIGS AND STRAWBERRIES ARE LOUISIANA CONTRIBUTIONS TO THE NATION'S FRUIT BOWL

Though figs grow in many parts of the State, those of the bayou districts are especially luscious. Quantities are now preserved and canned in the Teche country. When the strawberries in the Hammond district mature faster than the growers can pick them, the fruit which is too ripe to ship to northern markets is packed in barrels, a layer of berries to a layer of sugar, for subsequent conversion into jams and jellies.



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Natural-Color Photograph by Edwin L. Wisherd

EROSION HAS PRODUCED NEAR FRANKLINTON A MINIATURE GRAND CANYON

In Washington Parish the Universal Architect has designed a gorge which displays on a Lilliputian scale some of the beauties and wonders of the great chasm of the Colorado. Louisiana owes its existence to the silt brought down by the Mississippi River, and much of the State is only a few feet above sea level. The loftiest elevation, 400 feet, is in Claiborne Parish, on the Arkansas border.

CULTIVATING COTTON IN CADDO PARISH

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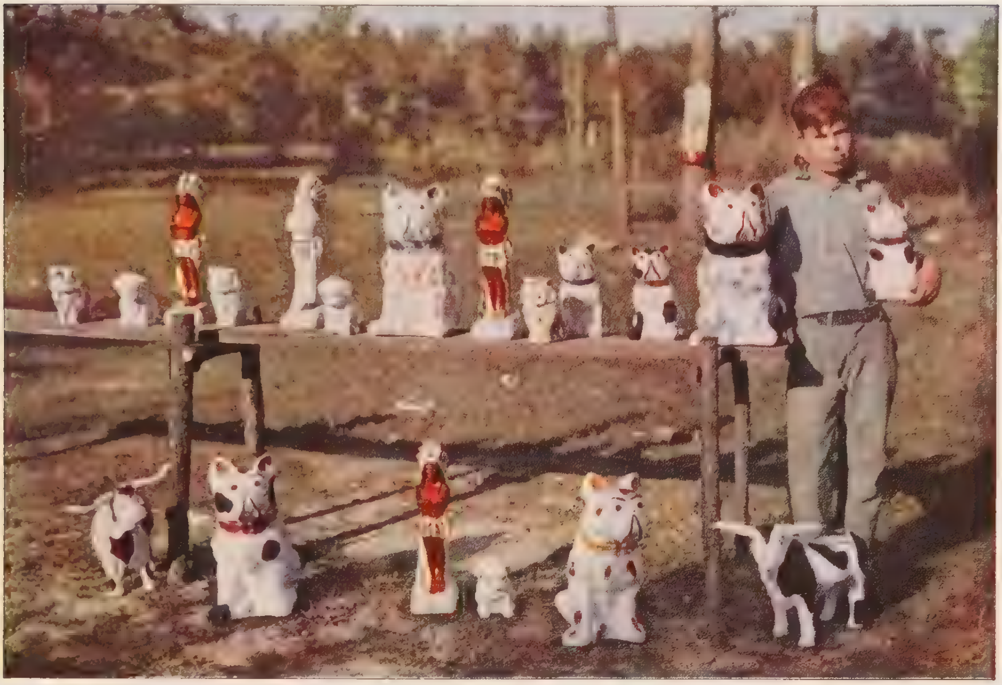
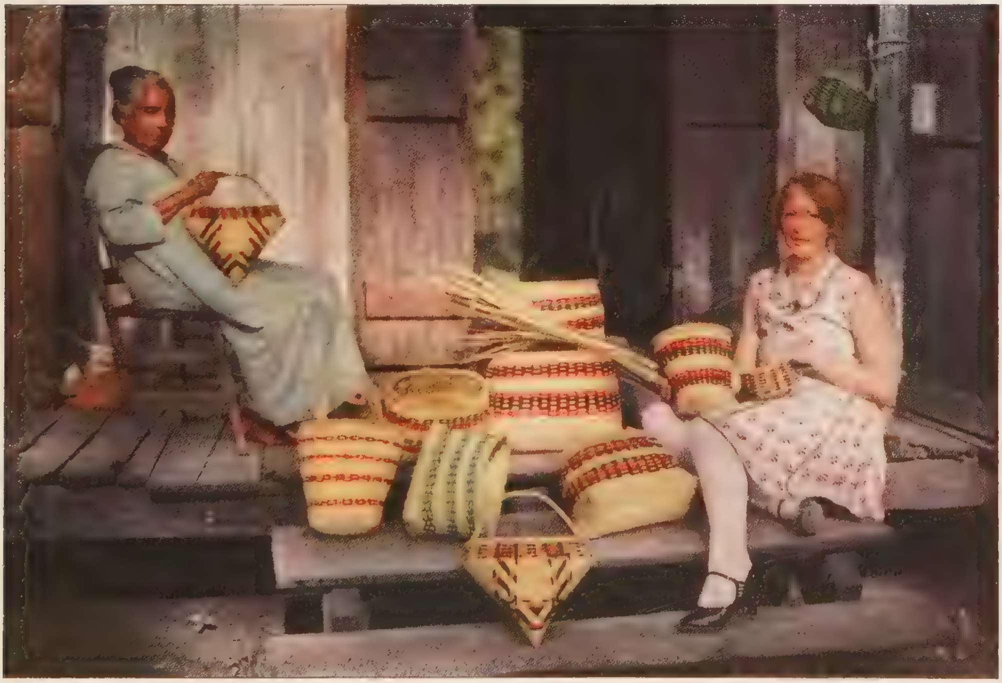
A WATERMELON FEAST IN NEW ORLEANS

Not even the marvels of Creole cuisine from the kitchens of La Louisiane, Antoine's, Arnaud's, or Galatoire's would tempt one of these to surrender the red heart of his melon.



WAYSIDE VENDERS OFFER PLASTER-OF-PARIS ORNAMENTS FOR DOORSTOPS



© National Geographic Society Natural-Color Photographs by Edwin L. Wisherd

ONE OF THE LAST OF THE CHOCTAWS NEAR LACOMBE

Her ancestors were once a power in the land but now only a handful of her people remain, and this venerable squaw maintains herself by weaving baskets from palmetto leaves.

AN ART COLONY FLOURISHES IN THE CONGENIAL ATMOSPHERE OF NATCHITOCHES

© National Geographic Society Natural-Color Photographs by Edwin L. Wisherd

BESIDE THE STILL WATERS OF BAYOU TECHE

Here, in the 18th century, came the French exiles from Acadia and here their descendants, "Cajuns," as they are known locally, still live.

the chefs of New Orleans's world-famous restaurants with the base for some of their most delectable dishes, thousands of pounds of the canned and dried seafood are shipped annually to the Orient.

A shrimp-drying factory is a simple affair. At Manila Village, both village and factory stand upon stilts at the edge of the bayou. Into a Gargantuan kettle of boiling water the freshly caught shellfish are plunged for a few minutes, then trundled out to a long, open platform, built in hill-and-dale fashion, where they are dumped. For two or three days they are stirred and raked back and forth with long wooden pushers until they are thoroughly sun-dried. If rain threatens, they are raked up on the "hills" of the platform and covered with tarpaulins. The rain drains off into the dales and the seafood remains dry.

After the drying process, the shrimp are thrown into big revolving hoppers which remove the shells, heads, and tails. These by-products are sold for hog feed and fertilizer. The remaining bodies are sorted for color, then packed in sacks paper-lined to exclude moisture.

The Asiatics, who buy much of Louisiana's output, prepare the dried shrimp for cooking by soaking in water to restore them to normal size.

It is variously estimated that dried shrimp will keep from one to six years, but the odor which permeates a factory suggests the wisdom of the slogan, "The sooner eaten the better," if pungency increases with age.

THROUGH THE EVANGELINE COUNTRY

Journeying by a series of autobus stages from New Orleans to Lake Charles, in the southwest corner of the State, one passes through a section of Louisiana which is redolent of romance. Here lies the Evangeline country, with its many pleasing, if seldom substantiated, stories identifying particular spots with various episodes in the Longfellow epic. This is the Teche country, settled by the Acadians after their expulsion from Nova Scotia. Felix Voorhies, a lineal descendant of the émigrés, says of it in "Acadian Reminiscences":

"The Acadians enriched themselves in a country where no one will starve if he is industrious, and where one may easily become rich if he fears God, and if he is economical and orderly in his affairs."

St. Martinville, one of the oldest towns in Louisiana, is the center of the Evangeline cult, with its Evangeline oak and its grave of the woman from whom the poet is supposed to have drawn his picture of the Acadian heroine. Hard by these spots of literary pilgrimage is a vegetable-products factory which has capitalized the Evangeline legend in the name of its sauces, its figs, and corn grown in this extraordinarily fertile region.

A MATCHLESS SETTING FOR A CLASSIC STORY

But St. Martinville suffered a setback some months ago when a motion-picture company selected Avery Island, twenty miles distant, for the bayou scenes in a pretentious film version of "Evangeline."

This privately owned island, one of the loveliest spots in North America, a bird refuge and a veritable semitropical botanic garden, with countless varieties of azaleas and hundreds of exotic plants growing to treelike proportions, provided a matchless setting.

As I stood beside the leather-jerkined Basil of the poem and watched the pirogues of the other actor Acadians slip silently through the cypress-stained waters fringed with overhanging palms and palmettos, only the discordant bark from the megaphone of the director, echoing over the encircling bayous and through the cathedral arches formed by the gnarled branches of ancient oaks swathed in the somber draperies of Spanish moss, called me back to to-day.

"How far is it to New Iberia, Uncle?" I inquired of a white-haired darkey field hand on Avery Island.

"Jes' a few acres up the road, Cap'n," he replied. An "acre," some 200 feet, is a common measure of distance in this part of the world.

New Iberia is one of a group of towns in southern Louisiana, including Lafayette, Franklin, and Thibodaux (birthplace of the late Edward Douglass White, Chief Justice of the United States), which not merely *exude* "atmosphere," but which have a substantial commercial life to support an indulgence in the easy existence

'NEATH THE SHADE OF A "COWCUMBER" TREE

commonly associated with the surrounding plantations of baronial proportions.

NEW IBERIA PASSES SALT AND PEPPER TO THE WORLD

Much of New Iberia's prosperity is traceable to its fur trade, to its neighboring salt mines, and to the world-wide popularity of a certain brand of red-pepper sauce whose name has been adopted into the language as a synonym for the ultimate in things hot for the palate. The peppers for this particular brand are grown on a field of 700 acres. They are never cooked, but are transferred from the pickers' baskets to barrels, where they ferment for two years; then the juice is drawn off into those familiar little bottles with green labels which decorate every table in America where oysters are served on the half-shell (see page 433).

Almost directly beneath these pepper fields lie inexhaustible thousands of tons of another condiment—salt (see pp. 432-4).

On an open-platform elevator I descended for 540 feet in Stygian darkness to the present floor of this salt mine. Its vast galleries are sixty feet in height, half again as wide in some places, and their winding length exceeds two miles. With electric drills, miners bore into the salt rock, set off their charges of dynamite, and blow out great blocks of pure crystal salt, which is scooped up in mechanical shovels and loaded on cars similar to those used in coal mines.

Directly over the mine shaft is the crushing mill, where the crystal rock is ground to the fineness desired, whether for table salt, cooking salt, freezing salt, or salt sawn into blocks for cattle. Test borings have shown that this formation continues from 100 feet below the surface to a depth of 2,200 feet. The amount of salt removed during the 30 years that the mine has been in operation has made no serious dent in the available supply.

INTO AMERICA'S PREMIER RICE COUNTRY

This southern tier of Louisiana at one time produced most of America's sulphur, too. Then the Texas sulphur mines came into production on an overwhelming scale. In recent months, however, new "domes" have been discovered in Louisiana, and the pendulum of sulphur supremacy may swing again to the Pelican State.

Swaying and swishing along at from 40 to 50 miles an hour over dirt and gravel roads which stretch straight and level for miles upon miles, one travels by bus from the Teche country into the center of the rice region, with its capital at Crowley. With a production of some 19,000,000 bushels a year, Louisiana not only produces more of the cereal than any other State in the Union, but it has one-half of the entire United States rice acreage.

Familiar with pictures of oriental rice culture, showing Japanese, Filipino, and Chinese farmers wading in muck and setting out plants by back-breaking manual methods, I had expected to encounter similar scenes here, with the difference that black men, women, and children would replace members of the yellow race.

Photograph by C. E. Walter

A SEVEN-POUND DEEP-SEA CRAWFISH TAKEN OFF THE LOUISIANA COAST

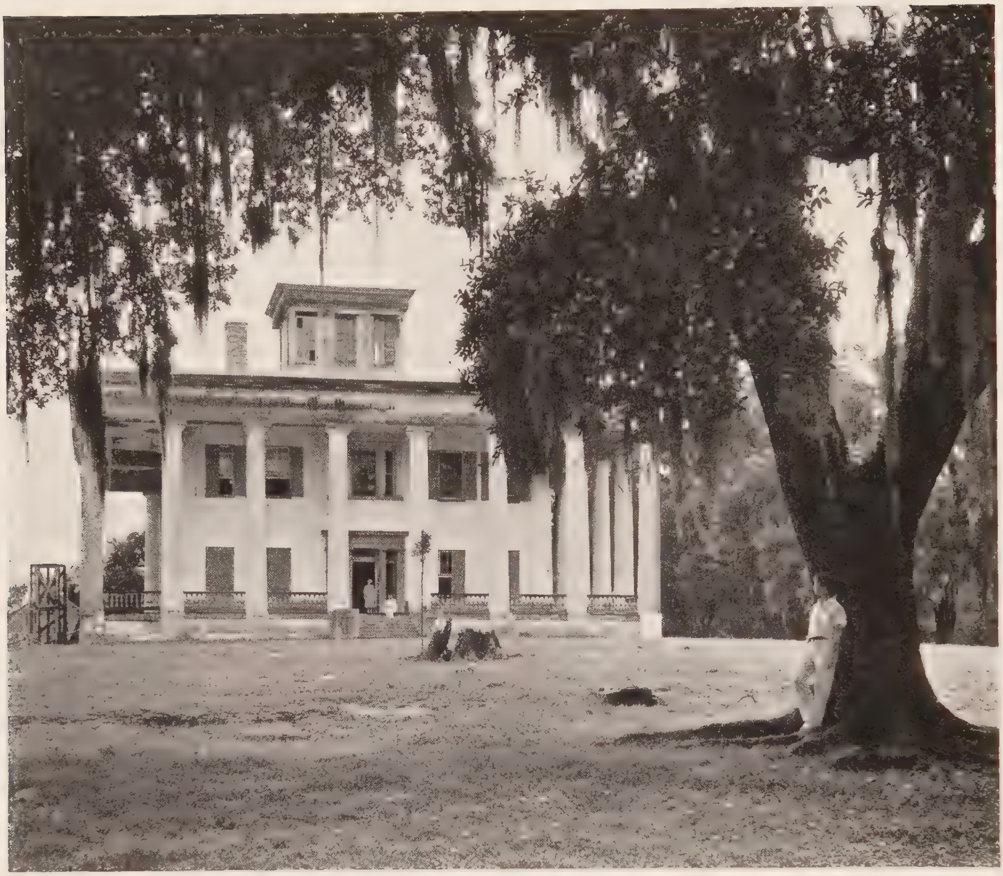
But rice is grown altogether differently in Louisiana. Here well-drained fields are cultivated by machinery similar to that used in growing wheat. Heavy tractors do the plowing, drilling machines the seeding, and modern binders the harvesting. Between the planting and the gathering, neither hand nor plow touches plant or field.

Rice is planted from March to June in fields which must be as level as tables; there cannot be a difference in elevation from one edge of a field to another of more than four inches!

Each field is surrounded by a tiny dike, and when the rice is three or four weeks old and has attained a growth of from eight to twelve inches, water is let on by gravity from surface canals. The main canals are from 50 to 150 feet in width and are supplied with water pumped in at a rate of from 50,000 to 300,000 gallons a minute. The two to four inches of water, through which the rice grows until within two weeks of harvest time, drowns out all weeds and choking grasses. The crop yield in this part of Louisiana is from 40 to 50 bushels to the acre.

The usual cost of irrigating water for the entire season is one-fifth of the rice crop.

There are no windmills in the rice country; all the pumping is done by steam, electric or oil-operated machinery, and the usual lift of water is from six to eighteen feet. It has been found unprofitable to



GREENWOOD HOUSE, "THE BEST EXAMPLE OF THE CLASSIC REVIVAL TO BE FOUND IN LOUISIANA"

Standing on a high hill a few miles from St. Francisville, this majestic plantation house, 100 feet square, with a lofty portico on all four sides, was built just a hundred years ago. The plantation surrounding it originally contained twelve thousand acres.

raise water to a higher level than twenty-five feet (see page 436).

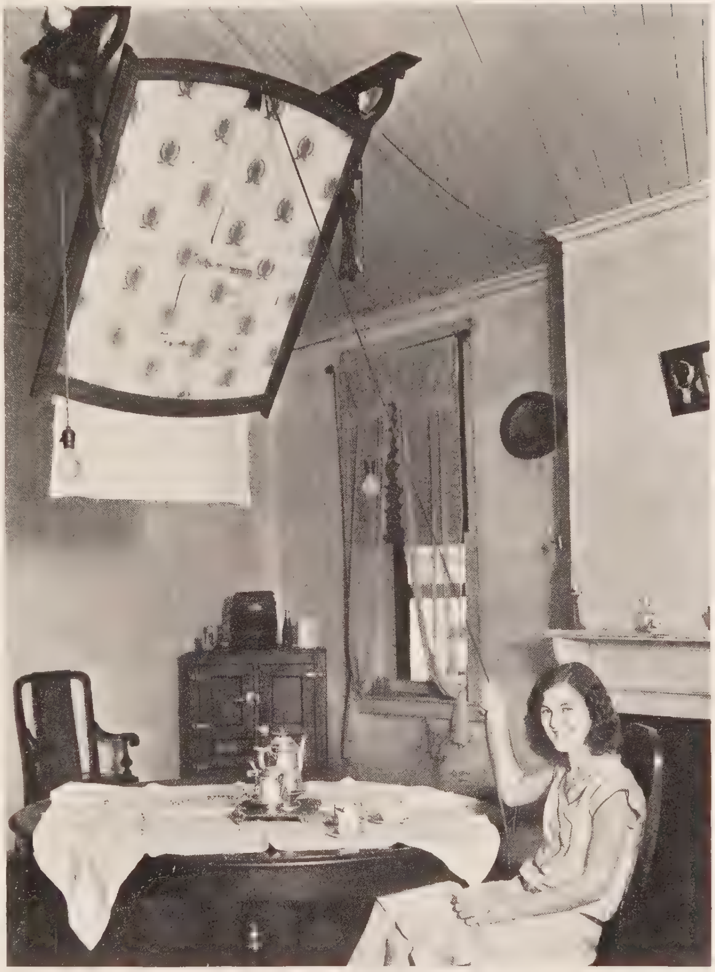
Louisiana rice growers ship quantities of their best grades to England and continental Europe. They will admit having only two rivals for quality—the planters of a small district in Italy and those in the vicinity of Valencia, Spain.

A RUSSIAN EMIGRANT BECOMES LOUISIANA'S RICE KING

In a spacious, richly furnished office on the second floor of a bank building in Crowley, I talked with the "Rice King" of Louisiana, an executive and farmer who operates many rice mills and controls 120,000 acres of rice land, including one plantation of 10,000 acres, one of the largest in the world.

There was not much of majesty in his bearing, but a wealth of romance in his story, which he modestly recited. An emigrant from Russia, he came to America as a boy 40-odd years ago. He tried to earn a livelihood packing cigars in New York, but at the end of each day he was dismissed for incompetence, until he had worked in all the factories of the city. Then he loaded a pack on his back and for two years peddled household cooking utensils, needles, and thread in Connecticut and New York State.

An acquaintance suggested that he would find a profitable peddling field in Louisiana. He plodded the muddy byways of southern parishes for many weary months, until he had saved enough to open a small general store in Crowley. That store building is still standing, just across the street from his bank building, and I imagine he allows the property to remain unimproved simply because he likes to stand at the window of his paneled private office and look down on this low rung of his ladder, where he frugally accumulated the capital for his first venture in rice and from which he has mounted to millions.



THE FORERUNNER OF THE ELECTRIC FAN

In olden times the "punka" was kept moving back and forth during the dinner hour by a pickaninny, who pulled on a rope as if he were ringing a bell. To keep the "oscillator" awake and the flies on the move, the former would fasten a bit of broomstraw between his upper and lower eyelid, so that the straw would give him a harmless prick whenever he batted an eye. This relic is in a St. Francisville house.

LONG CANAL MAKES LAKE CHARLES A SEAPORT

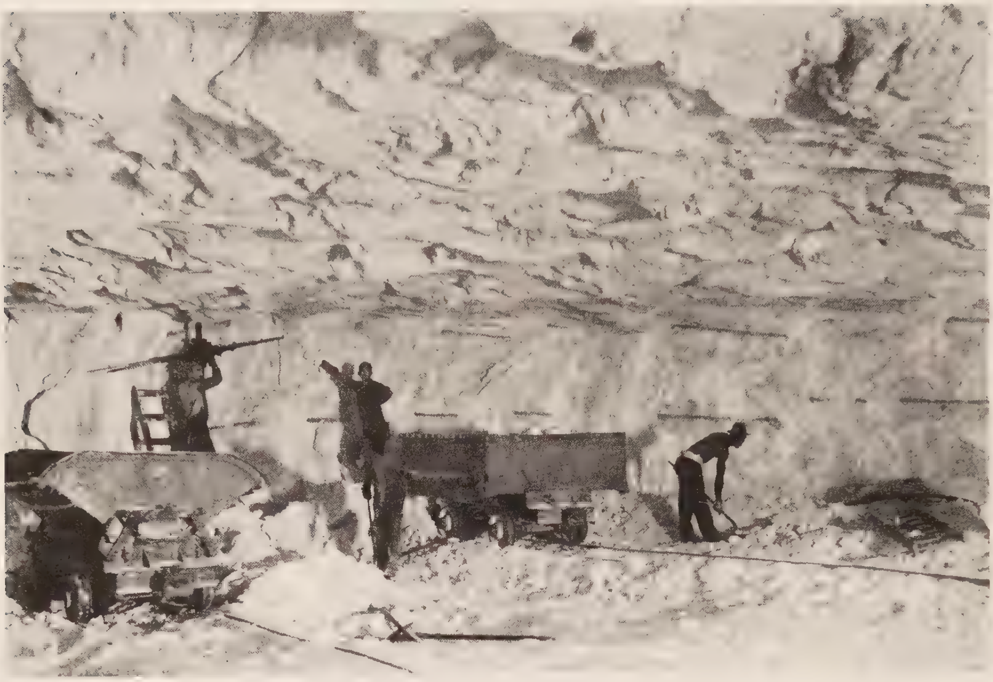
Fifty miles west of Crowley one comes to Lake Charles, sixth city of the State in point of population and one of the most aggressive communities in the South. Much of the prosperity of Lake Charles may be traced to the activities of a small group of bankers, most of whom migrated to Louisiana from the Middle West at the turn of the century. Their influence is evident in every avenue of city and parish development.

Although it is situated 75 miles from the Gulf of Mexico, Lake Charles is an important seaport. It is reached by a series of waterways the most important link of which is a canal, built by parish and United States Government funds, that runs as straight as a string for 21 miles and has a depth of 30 feet and a bottom width of 125 feet, all of which is maintained without dredging and without locks. "No tide, no current, plenty of water—what more could a sailor want!" exclaimed a United States naval officer at the official opening of the docks in November, 1926.

Ships from many European ports come up to Lake Charles for cargoes of rice prepared and packed in one of the world's largest rice mills (see pages 437-8).

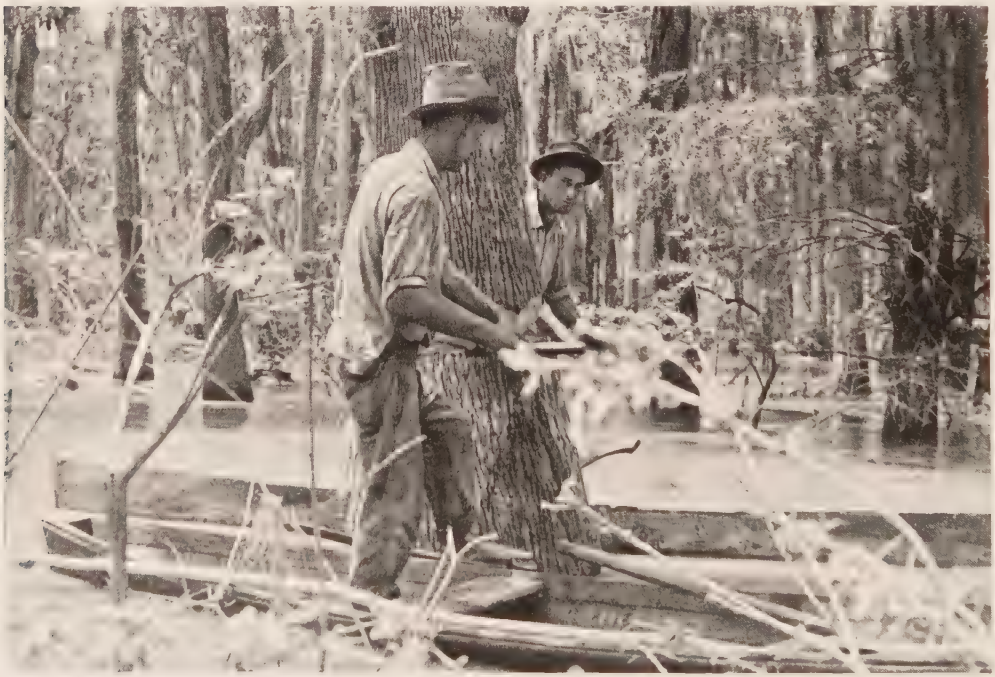
MAKING RICE FIT FOR FOOD

A trip through such a mill gives one a new respect for food. Process after process is required to prepare rice for human consumption. First, grass and weed seed, sticks, and other extraneous refuse must be removed from the grain, as it comes sacked from the harvesting machines.



A SALT MINE AT JEFFERSON ISLAND, WEST OF NEW IBERIA

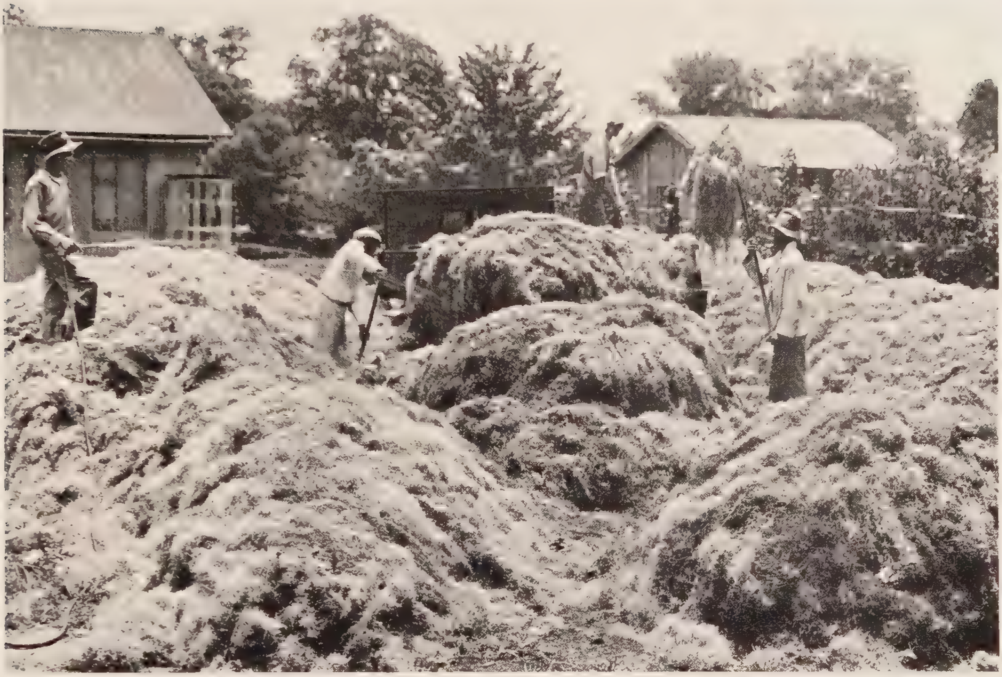
After being drilled and blasted down, the rock salt is ground fine and is then ready for table use without any purification process.



Photograph by Ewing Galloway

GETTING TIMBER OUT OF THE SWAMPS IN THE ACADIAN COUNTRY

Two Acadian (Cajun) lumberjacks stand in dugouts or pirogues and pull a saw or swing an ax without moving the boats enough to upset them. Few lumberjacks outside the bayou region could do the trick. After the trees are cut the logs are assembled into rafts (see illustration, page 440) and towed to the mill.

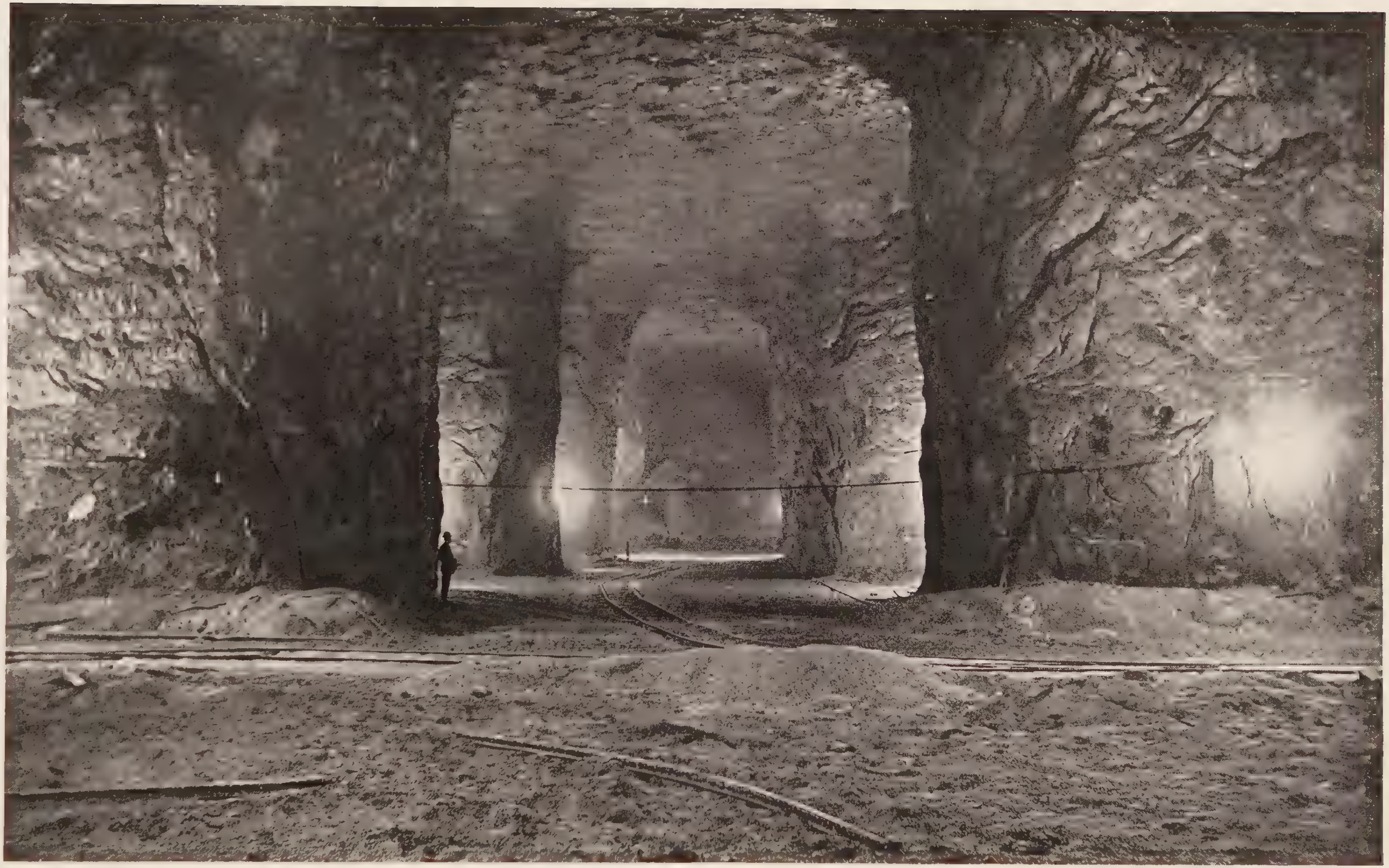


PREPARING SPANISH MOSS AT ST. MARTINVILLE

The moss is soaked with water to hasten decomposition of the outer layer. The inside fiber will then be used in upholstering.

HOT STUFF: PEPPERS AND SAUCES MANUFACTURED IN ST. MARTINVILLE

On a 700-acre tract on Avery Island, near New Iberia, is grown a special variety of peppers, from which is made a sauce known round the world (see, also, text, page 428). The entire Teche country is a fertile farming district, whose products are marketed fresh in New Orleans and neighboring cities and preserved or canned for consumption elsewhere (see page 427).



Photograph by Martin

CYCLOPEAN TUNNELS HEWN AND BLASTED THROUGH SOLID SALT

For miles these galleries, in many places 60 feet in height, extend beneath Avery Island. The salt rock is loaded on small tram cars electrically operated, much as coal is mined (see, also, text, page 428).

PIRATES AND SMUGGLERS ONCE HAUNTED THE PEACEFUL WATERS OF CONTRABAND BAYOU

Many are the picturesque bays and inlets of the Gulf coast of Louisiana which have their traditions of days when lawless crews haunted such waters. This moss-hung bayou, near Lake Charles, is associated with many daring tales of the long ago.

CATCHING FISH WITHOUT LINE OR BAIT

Boys scoop them up along the docks at New Orleans and Lake Charles. Crawfish, the essential ingredient of a famous Creole bisque, and frogs are caught in the same way. Louisiana ships annually to all parts of the United States, and occasionally to Winnipeg and Honolulu, some six million pairs of frogs' legs. Dealers in the frog center of Rayne report that Cleveland, Chicago, Cincinnati, and Pittsburgh are their best customers.

POWERFUL PUMPS ARE REQUIRED TO PROVIDE WATER FOR THE RICE FIELDS

This pumping station lifts water from the Sabine River to a higher level, where it is diverted through canals and into rice fields in the vicinity of Lake Charles. Last year's Louisiana rice crop exceeded 19 million bushels and was worth to the State within a fraction of a dollar a bushel (see text, pages 430 to 437).

LOADING RICE AT LAKE CHARLES

An inland seaport accessible to the Gulf by a 30-foot channel, Lake Charles ships a large percentage of Louisiana's rice directly to foreign countries. One of the largest rice mills in the world is located here (see, also, text, page 431).

Between two enormous emery wheels, adjusted with the utmost nicety to clip off the very tips of the grain, the cleaned rice next passes; then to the hullers, which brush off the outer covering. The hullers deliver the grain to an intricate "shimmy" machine, which makes the unhulled particles climb one way while the hulled grains drop into a trough.

The unhulled rice goes back to the emery wheels, which must now be set closer together to clip off the tips of undersized grain, while the hulled grain passes on to new buffers that remove the fifteen layers or cuticles surrounding the white kernels. One of these layers is a rice powder which is rich in protein, but which must be removed to prevent the rice from becoming rancid.

Other shimmying machines separate the whole grain from the half and quarter grains, or screenings, the latter being known as brewers' rice.

European markets demand a coated rice, so the grain designed for export must go back into revolving bins into which a thin stream of glucose and a small quantity of Italian talc are injected. After it is heated, the rice comes out coated. This coating has no utilitarian value; in fact, it should be rinsed off before the cereal is cooked.

Adjoining this rice mill is a cellulose plant which utilizes some of the rice hulls, but the supply is greater than the demand, so that the surplus is burned as fuel. The hulls must be ignited in the air, and a glimpse into the firebox beneath the great boilers suggests a fairyland with myriad fireflies in motion. The ashes are so fine that a stream of water flowing through the ashpits is used to convey the residue to a river bank.

Some day, perhaps, an inventive genius will find another profitable use for rice hulls, just as the refuse of the sugar mills is now converted into insulation board and the refuse of the sawmills is converted into kraft paper (see text, page 454).

It is a leap almost the length of the State from Lake Charles to Louisiana's

BAGGING RICE BY MACHINERY

From the time the seed is sown until the cereal reaches the ultimate consumer, there is no need for rice, as grown, harvested, and milled in Louisiana, to be touched by human hands (see text, page 429).

second city, Shreveport, in the northwest corner, and the leap carries one completely out of the State, with respect to the "atmosphere" to which one has become acclimated in the vast southern bayou country.

A CITY OF WEALTH AND ENERGY

Here one finds a busy, pulsing manufacturing and commercial life which is customarily associated with prosperous, progressive cities of the East and Middle West. Only an occasional touch, such as the exotic architecture of the Shreveport fire stations, reminds the visitor that he is still in Louisiana land. Its urban homes are among the finest in the State and in per-capita wealth it ranks among the first cities of the South.

In its name the city perpetuates the memory of one of the most picturesque characters of the early nineteenth century, Henry M. Shreve, "the first great river captain" and the designer of the flat-bottom, double-deck Mississippi River steamer which has done its work so well for more than a century on the inland waters of America (see pages 439-440).

It was Captain Shreve who in 1833-36 performed for the United States Government the herculean task of destroying the Great Raft, a jam of driftwood, logs, and other débris which had been forming for many years and which finally dammed the Red River for a distance of 140 miles, obstructing navigation into Indian Territory and menacing all this section of Louisiana and neighboring Arkansas.

A few miles out of Shreveport one comes to the edge of the famous oil-producing Caddo Lake, lying partly in Louisi-

Photograph by Ewing Galloway

THE "AMY HEWES" ON THE BAYOU TECHE

Along this winding, slow-flowing waterway in the Acadian region the old-fashioned steamboat runs on schedule and stops at plantation landings to oblige passengers and small shippers.

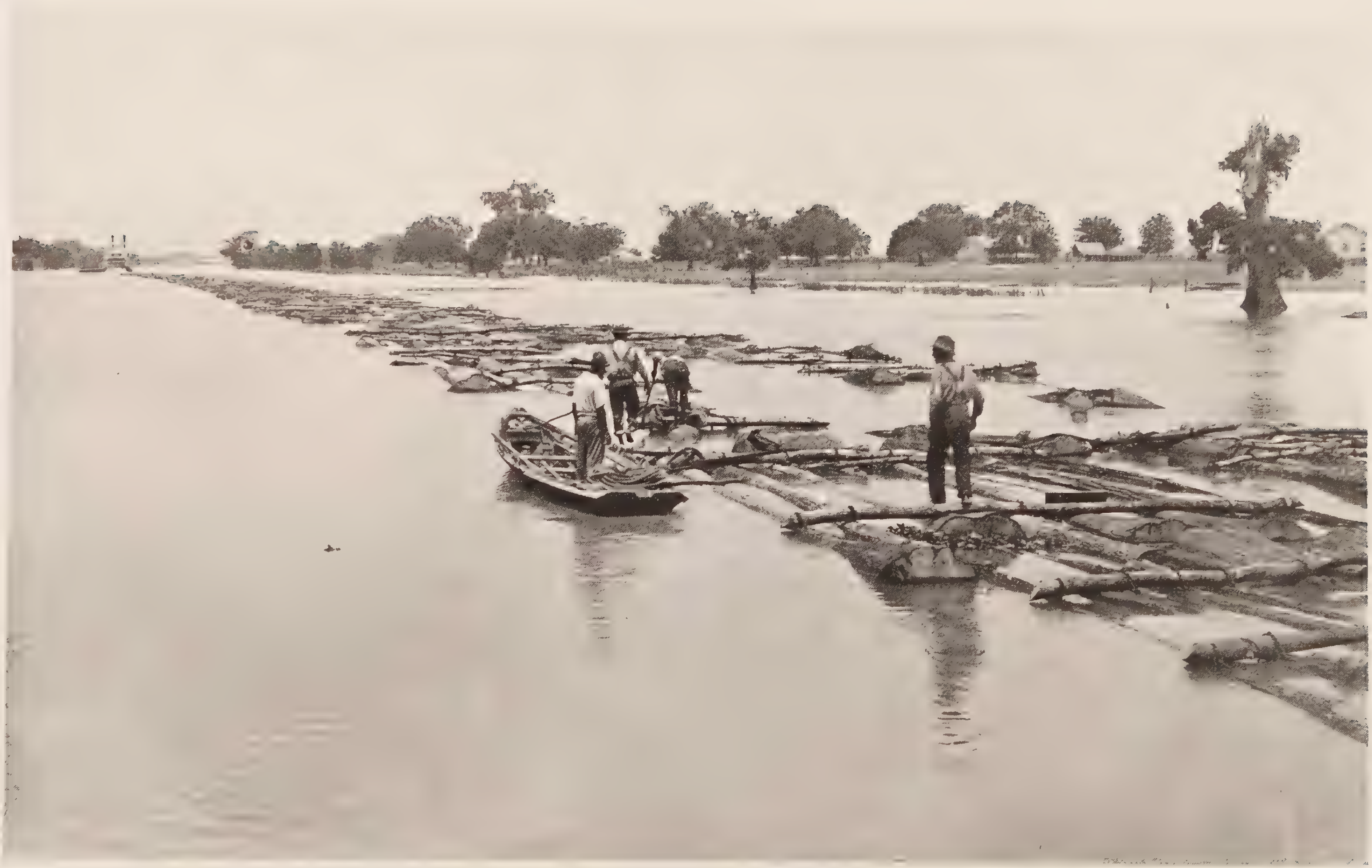
ana and partly in Texas. It was here that the first attempt in the United States was made to pump oil from the bed of a lake.

While spectacular gushers have focused popular attention in recent times upon oil-producing areas in other parts of the United States, some two hundred wells in the Caddo-Shreveport district continue to chug away profitably year after year, much of their output being pumped ashore through a network of pipe lines which run beneath the surface of the lake.

SHREVEPORT IS BUILDING AMERICA'S LARGEST AIRPORT

But just now Shreveport is less interested in her oil wells and in her great window-glass factory, with its endless ribbon of glass, seven feet wide, spinning out a quarter of a million square feet every 24 hours, than in the nascent "largest and most modern flying field in the world." Her citizens are buying 22,000 acres of choice river-plantation land three and a half miles east of the city, which is to be presented to the Federal Government, and here the United States Air Corps will establish its Third Attack Wing.

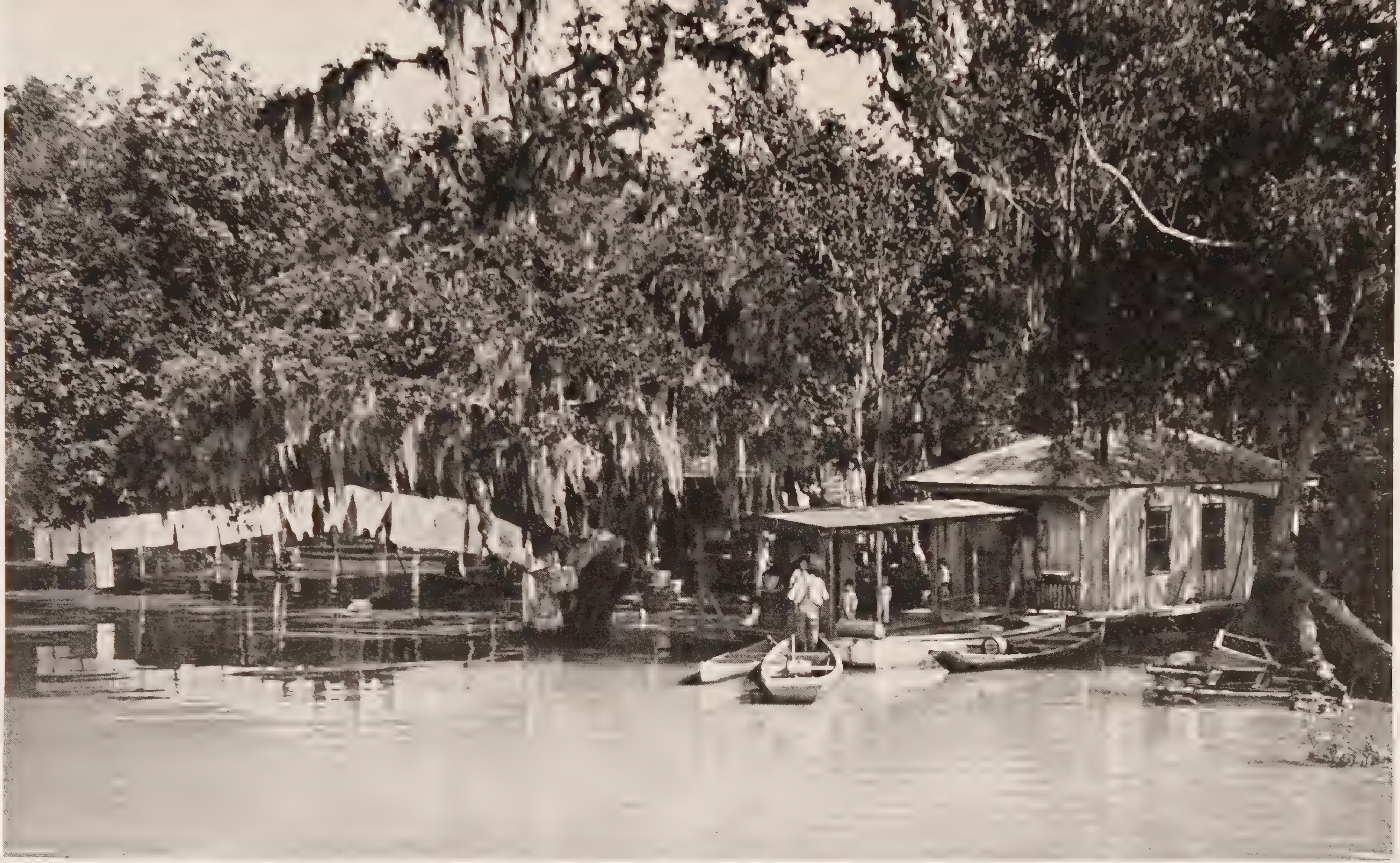
The initial investment of the War Department at this field will be $8,000,000, most of which will go to build a virtual city on the site. The field itself will have a landing area three miles long in the direction of the prevailing winds and more than a mile and a half wide, with an additional mile on either end for landings if necessary. Fifty pursuit planes, fifty-two attack planes, six observation, and two cargo planes will constitute the Army's



Photograph by Ewing Galloway

LOGGING ON THE BAYOU TECHE, IN THE ACADIAN REGION OF LOUISIANA

Such rafts of cypress, sometimes half a mile in length, are tied together and towed by a steamboat (see text, page 438). The men in the foreground are on guard to prevent the logs from jamming.



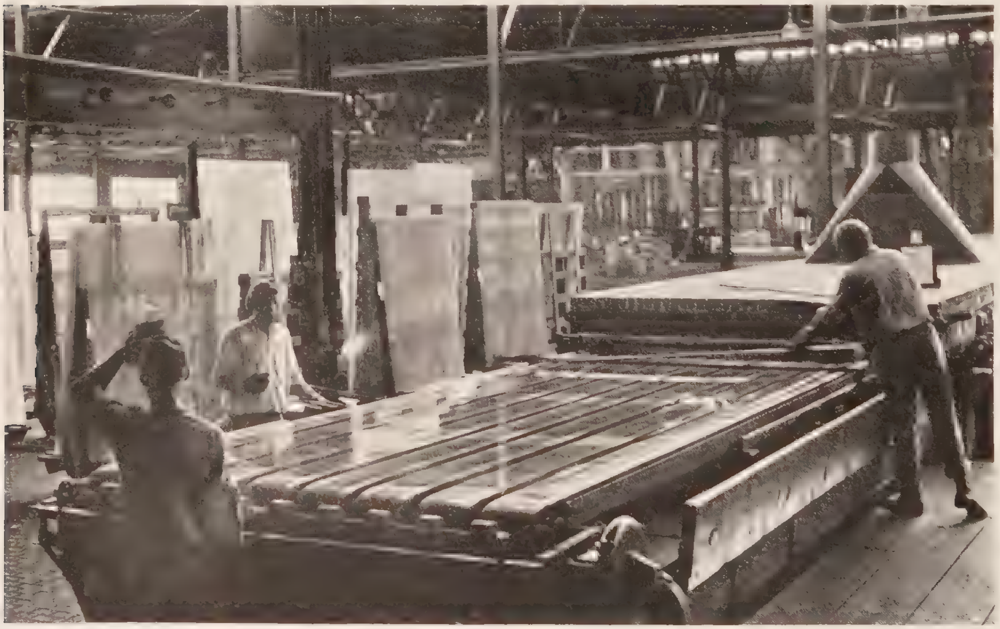
Photograph by Ewing Galloway

LUMBERING IN THE SWAMP REGION

The wife of a lumberjack, or "swamper," hangs her washing out to dry over water. When his job in one spot is finished, the swamper puts out in his houseboat and drifts along to the next location (see, also, illustration, page 432).

THE NEW CADDO PARISH COURTHOUSE AT SHREVEPORT

A feature in courthouse construction in Louisiana is the installation of the county jail on the top floor, with the result that one of the finest views of Shreveport, second city of the State, and the surrounding fertile cotton country is obtained from the prison windows of this building.



CUTTING GLASS INTO SHEETS AT A SHREVEPORT FACTORY

From the annealing furnace the glass travels slowly in a ribbon seven feet wide. Working continuously, this factory produces a quarter of a million square feet of glass every 24 hours, using sand obtained chiefly in Arkansas, which bounds Caddo Parish on the north. Natural gas, so abundant in this section of Louisiana, provides the cheap fuel necessary.

flying equipment for this mammoth field, with its personnel of more than 1,500 officers and enlisted men.

From dynamic Shreveport it is only a morning's ride, by way of Mansfield and its famous Civil War battlefield, to Natchitoches, founded in 1714, and therefore the oldest town in the Louisiana Purchase area.

With the advent of the steamboat in the Mississippi Valley, Natchitoches (pronounced Nakkitosh) had illusions of commercial grandeur second only to New Orleans; but the Great Raft (see page 439) played the town a sorry trick by permanently diverting from it the channel of the Red River. To-day, far removed from the rapid currents of big business, it clings to the banks of its long sliver of a lake and contents itself with the seasonal influx of an appreciative army of fresh-water fishermen from all northern Louisiana.

A SPARK FROM A LOCOMOTIVE STARTED THIS OIL FIRE

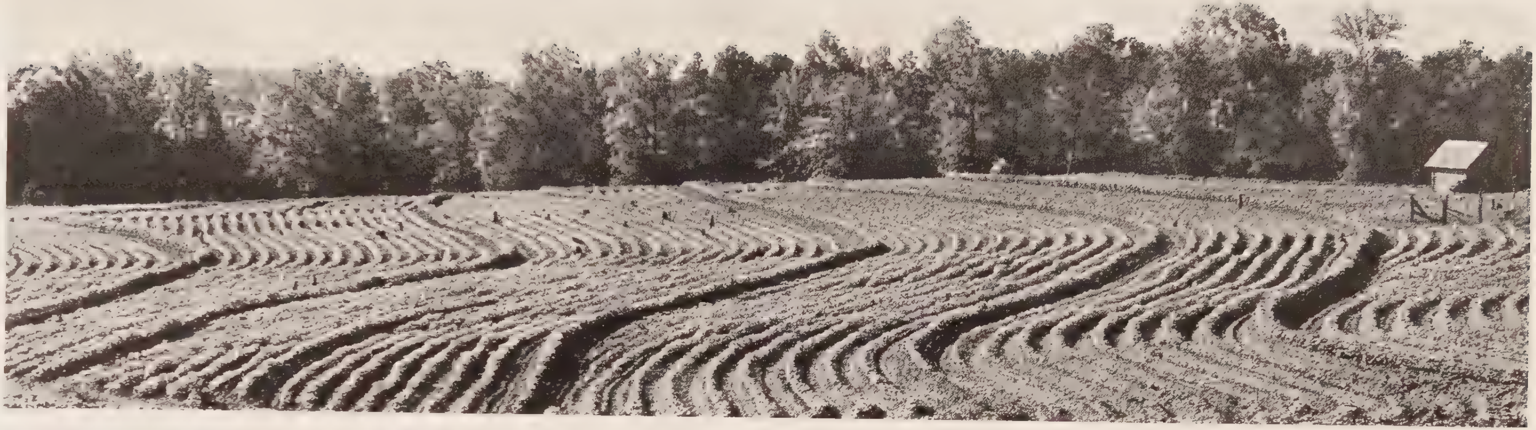
Among the products of Louisiana's fields and mines, petroleum ranks second only to cotton. Its wells produced more than 20 million barrels in 1929, and gave the State sixth place among the oil Commonwealths (see, also, text, page 448). A man in the right foreground watches the progress of the flames.

In the many lovely homes which surround the campus of the State Normal College located here, one finds a truly charming academic atmosphere. In one of these I was invited to examine a remarkable collection of Caddo Indian relics—a small museum of priceless finds collected in the vicinity.

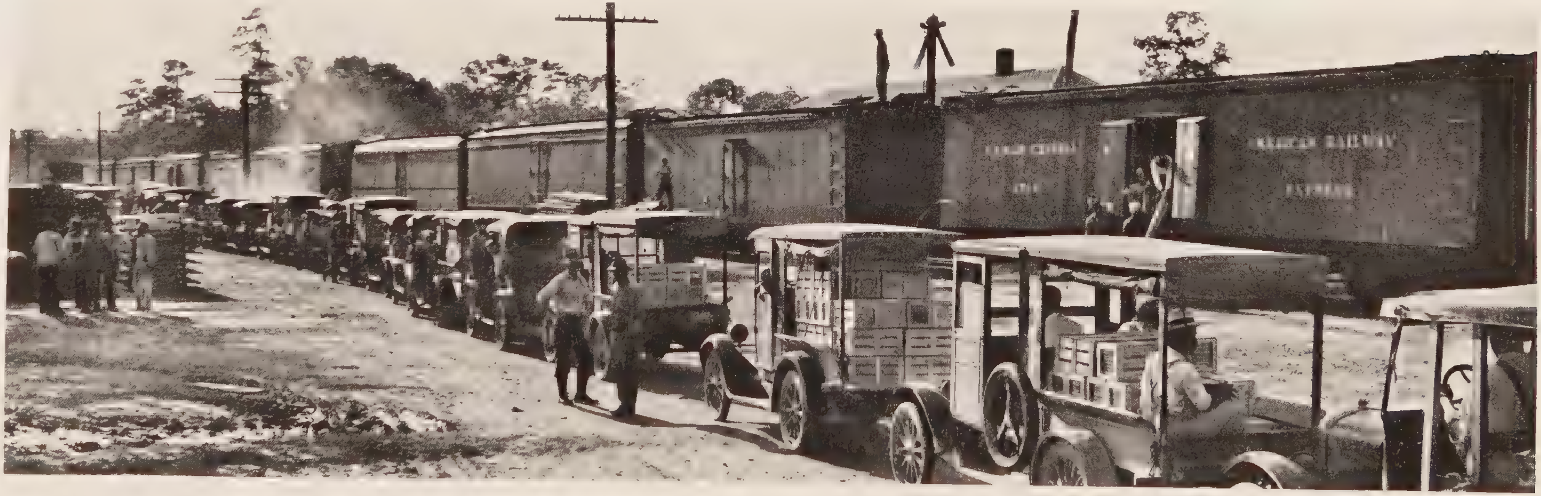
There is much of myth, legend, and tradition connecting Natchitoches with certain scenes in "Uncle Tom's Cabin," but there is no myth about the unique bronze statue of a Negro, hat in hand, which occupies a commanding site in the town and which bears this inscription:

> "Erected by the City of Natchitoches in grateful recognition of the arduous and faithful services of the Good Darkies of Louisiana. Donated by J. L. B. Ryan, 1927."

Farther down the Red River Valley, in the geographical center of the State, is flourishing Alexandria, where one encounters something of the ante-bellum charm of Natchitoches combined with the commercial vigor of Shreveport. Few outsiders will recall that at the outbreak of

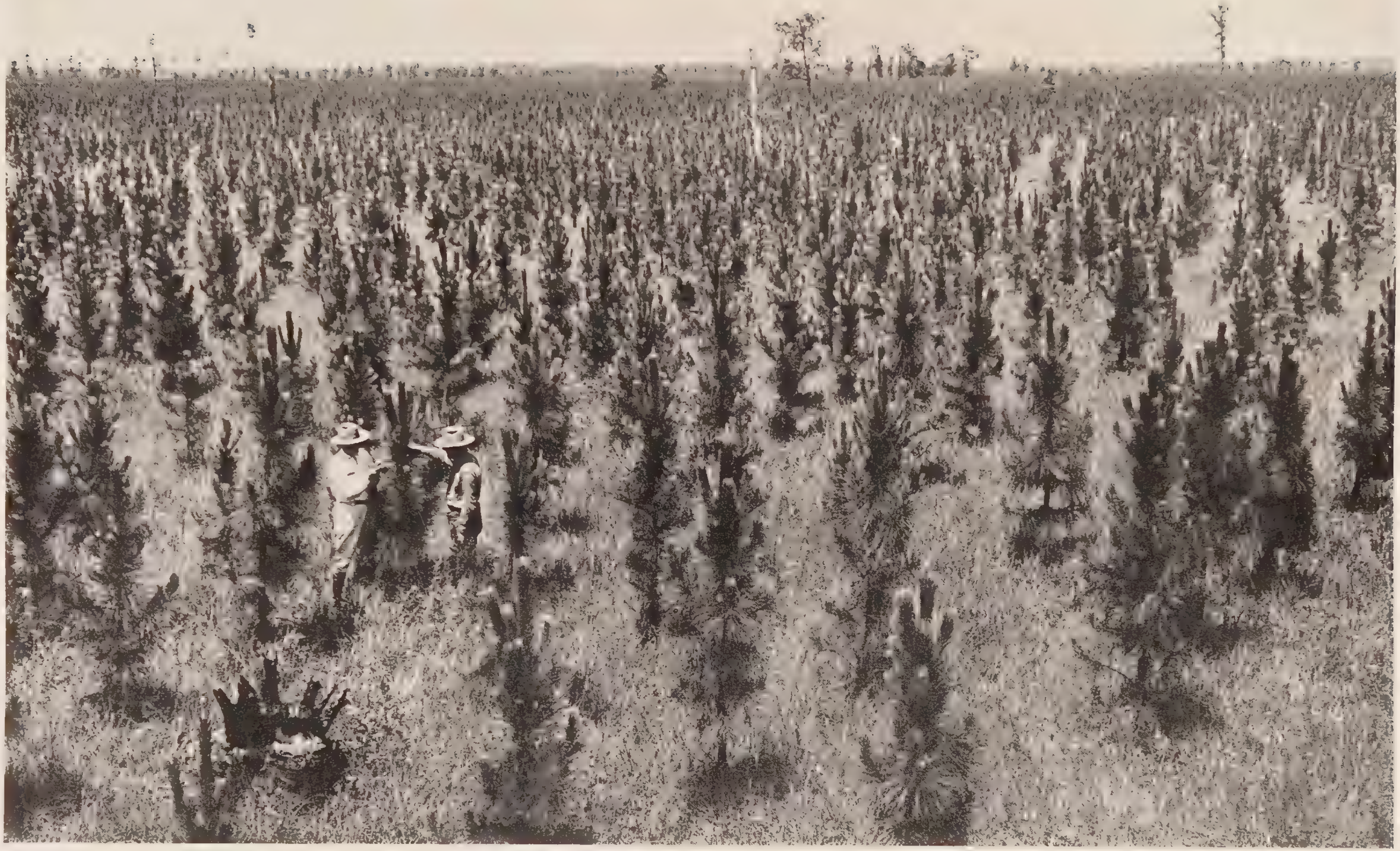


FARMERS AROUND MANSFIELD CULTIVATE THEIR FIELDS IN SINUOUS ROWS TO KEEP THE TOP SOIL FROM WASHING AWAY DURING HEAVY RAINS



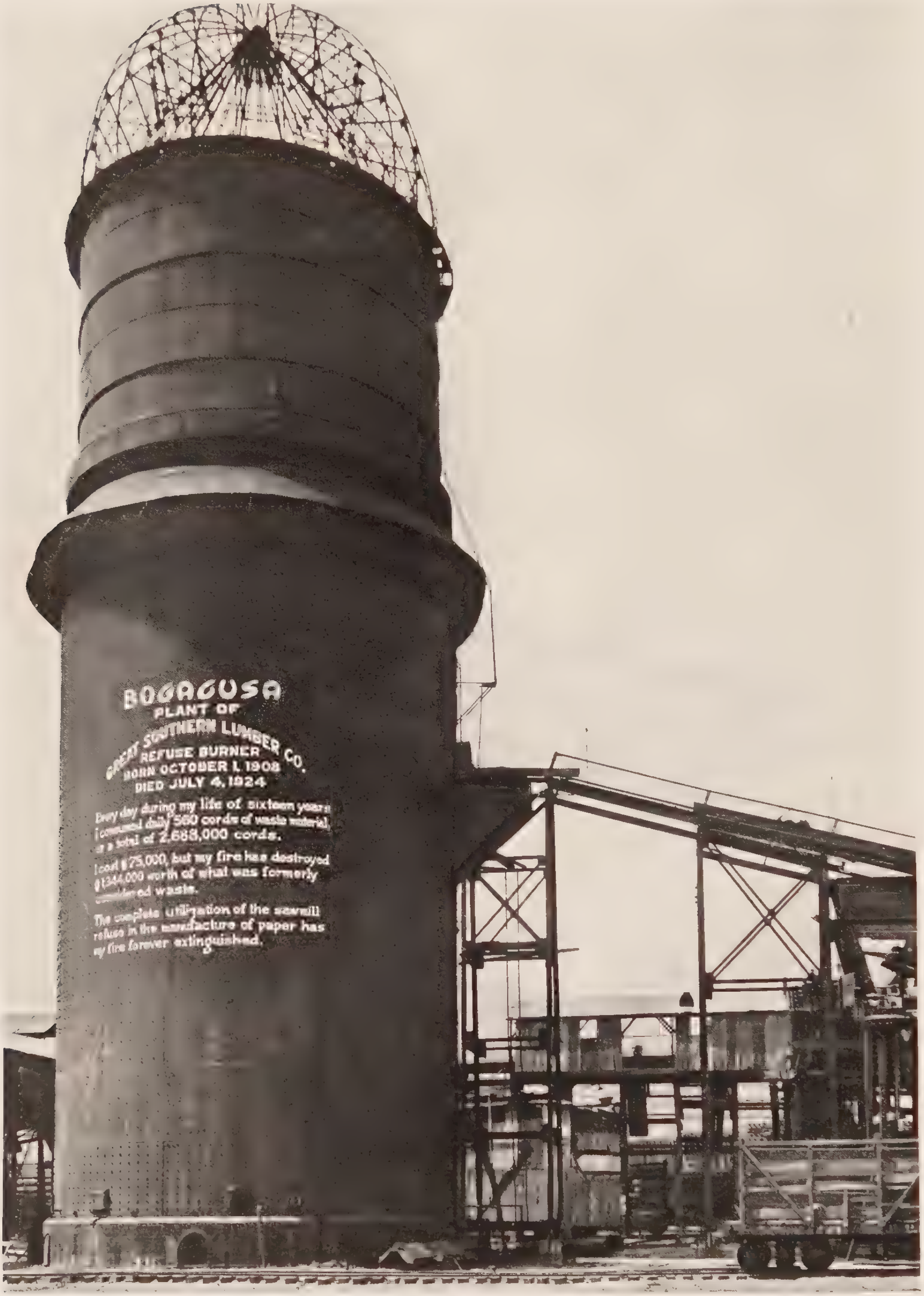
LOADING INTO REFRIGERATOR CARS THE DAY'S PICK FROM LOUISIANA'S "STRAWBERRY PATCH"

Every day during the season the growers begin to load as early as 3 o'clock in the afternoon, and by 7 o'clock every berry suitable for shipment that has been gathered during the day is rolling toward a distributing center farther north, to be rerouted after the auction that takes place in Hammond each evening (see text, page 452).



NEW FORESTS FOR OLD

While reforestation has been practiced for many years in Europe and in some sections of the United States, it is a comparatively new undertaking in the pine lands of the South. This is a field of seven-year-old slash pines, planted from nursery-grown seedlings at Bogalusa (see, also, text, page 449).


BOGALUSA
PLANT OF
GREAT SOUTHERN LUMBER CO.
REFUSE BURNER
BORN OCTOBER 1, 1908
DIED JULY 4, 1924
Every day during my life of sixteen years
I consumed daily 560 cords of waste material,
or a total of 2,688,000 cords.
I cost $75,000, but my fire has destroyed
$1,344,000 worth of what was formerly
considered waste.
The complete utilization of the sawmill
refuse in the manufacture of paper has
my fire forever extinguished.

NO MORE WILL SMOKE COME FROM THIS EXPENSIVE BURNER

The inscription tells its own story of how the prevention of waste has resulted in a profitable by-product (see text, page 451, and illustration on opposite page). The "monument to waste" rises on the property of one of the world's largest sawmills. Squared timbers are being brought from California to keep it operating on full time until reforested pine lands come into production.

KRAFT PAPER FROM SAWMILL REFUSE

A paper factory now adjoins the mill at Bogalusa, utilizing the waste lumber which formerly was burned in a large incinerator (see text, page 452, and illustration on opposite page).

the Civil War, William Tecumseh Sherman had just completed his first year as president of Louisiana State Seminary (afterward the State University), located here. When Louisiana joined the Confederacy he resigned his teaching post, and four years later he was "marching through Georgia."

IN THE NATURAL GAS AND CARBON-BLACK CENTER

The municipal antithesis of Natchitoches, with its "pansies for thoughts and rosemary for remembrance," is Monroe, "gas and carbon-black capital of America."

The first men who struck gas in Monroe, 14 years ago, were deeply disappointed, for they were seeking oil; but their temporary misfortune has spelled millions for this city, which is as nearly a spotless town as any community of its size in the country. Within an area 30 miles wide by 40 miles long, there are nearly 700 gas wells, having a daily capacity of more than eleven billion cubic feet. These wells supply power fuel for as low as three cents a thousand cubic feet, and manufacturing plants as far away as Houston, Texas; New Orleans, St. Louis, Memphis, and Atlanta are connected with the natural-gas fields by 22-inch pipe lines.

Carbon black is a wasteful by-product of the gas wells. For several years all of this ingredient of paints, lithographer's inks, printer's inks, and automobile tires produced in the United States came from Monroe, but Texas gas wells have recently cut this monopoly down to about 75 per cent. When your automobile tire manufacturer increased the guarantee on the life of your tire from 4,000 to 8,000 miles, the use of carbon black in the treatment of the rubber was largely responsible for the doubled longevity.

Only about 3 per cent of the gas is utilized in making carbon black; at present the heat generated is lost completely, and there is a considerable waste in the leaden pall which hangs constantly over the landscape on the outskirts of Monroe. Clinging black particles impregnate the atmosphere, and it is difficult to distinguish the "permanent" black laborers from the "sunup-to-sundown black" white workmen around the plants.

One of the most interesting activities in

"OLD MAN RIVER"

Spirituals and "roustabout" songs are still sung by the deckhands on old backwheelers which ply the waters of the Mississippi Valley (see, also, page 439). This group was photographed on the Ouachita River, near Monroe.

in polishing the floor where we had tracked in bits of carbon black.

The pride which Monroe takes in its admirably equipped 140-acre airport is second only to that encountered in Shreveport. A local company with a fleet of 22 planes not only operates a daily passenger service between Dallas, Shreveport, Monroe, Jackson, Meridian, Tuscaloosa, and Birmingham, but it dispatches planes throughout the South and to Peru to dust growing crops with chemicals to check the ravages of the boll weevil and other destructive insect pests. The landing field of the port itself was planted with grass sown by a dusting machine.

THE BIGGEST INDUSTRIAL PLANT IN LOUISIANA

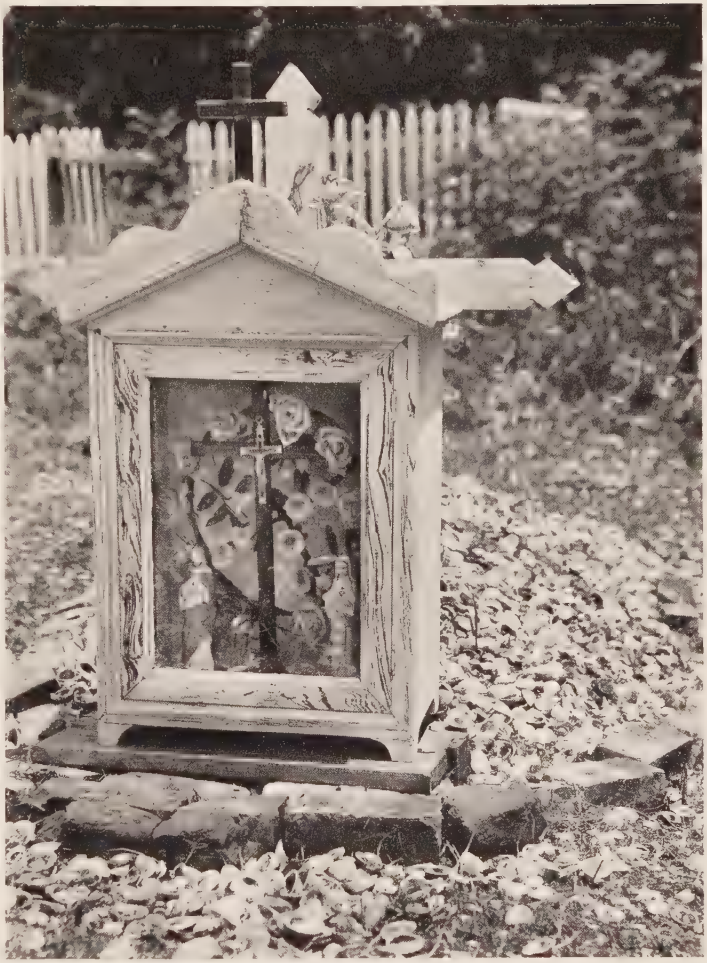
Third city of the State, situated at the head of deep-sea navigation on the Mississippi, seat of government, and of the magnificent newly housed State University, the chief distinction of Baton Rouge, from the standpoint of the "outlander," is that it is the home of that vast manufacturing establishment, the refinery of the Standard Oil Company of Louisiana.

The statistics concerning this gigantic plant, which is rated as one of the two or three largest in the world, are staggering in their immensity. It spreads over 1,600 acres, covering as much ground as famous Rock Creek Park, in Washington, D. C. The tax assessment value of the plant is $45,000,000; it employs 4,500 people, with an annual payroll (by check, to thwart

the vicinity of Monroe is a gigantic 124,000-horsepower gas-operated plant located at adjacent Sterlington. Here all the attendants are dressed in white, and there is neither odor, dirt, nor smoke about the place—only the constant purr and hum of the tremendous turbines and dynamos. On the third floor is the control room, where three men are constantly on watch. They know instantly if trouble occurs on any of the lines radiating in a great mesh of wires to the more than 240 towns and cities which the plant supplies with light and power. As we left the plant, the white-clad attendants were busily engaged gunmen) of more than $8,500,000.

Although the plant itself makes fuel oil, as well as all grades of gasoline, kerosene, lubricants, paraffin, and coke, in its retorts and furnaces *it burns gas,* supplied by the Monroe fields. In reducing crude oil through various grades to the ultimate desideratum, coke, its daily consumption of water is a third greater than that required to meet the demands of the entire city of New Orleans, with close to half a million inhabitants.

The crude oil is pumped into the Baton Rouge plant from fields in Louisiana, Arkansas, and Oklahoma, but occasionally additional supplies must be shipped in by barge. The people of the community are still talking about one cargo of petroleum, which arrived by the river route in 19 steel barges towed by the steamer *Sprague* in March, 1926. The tow was a block wide and four city blocks long, and it would have required 28 trains of 40 tank cars each to move it; yet this huge supply was enough to keep the plant in operation for only a little more than two days!



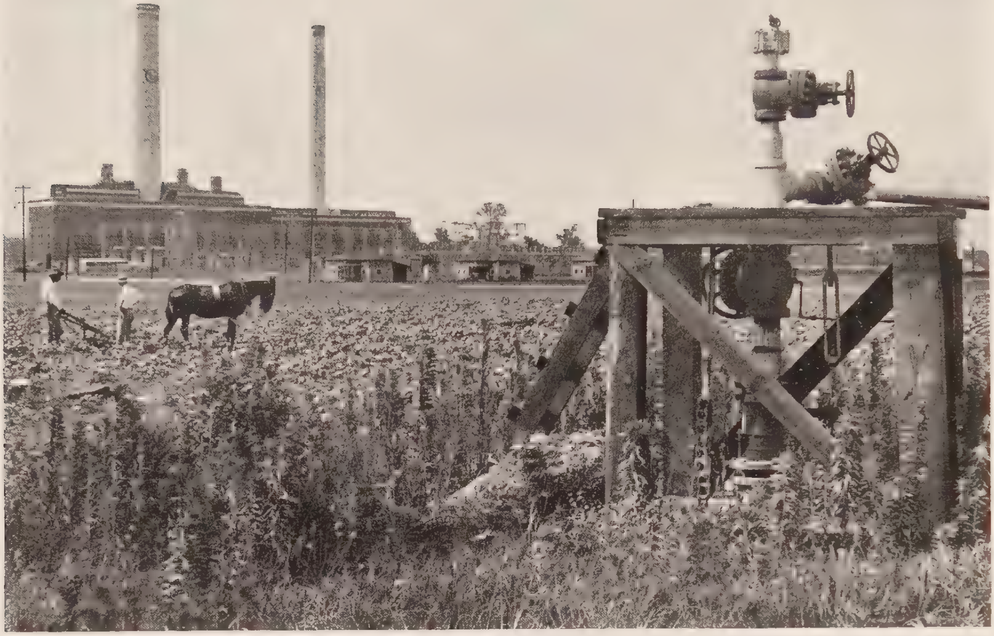
ARTIFICIAL FLOWERS IN A GLASS-FRONT BOX MARK A BARATARIA BAYOU GRAVE

Over children's graves these boxes often contain dolls as well as flowers.

LOUISIANA LOOKS AHEAD IN FOREST CONSERVATION

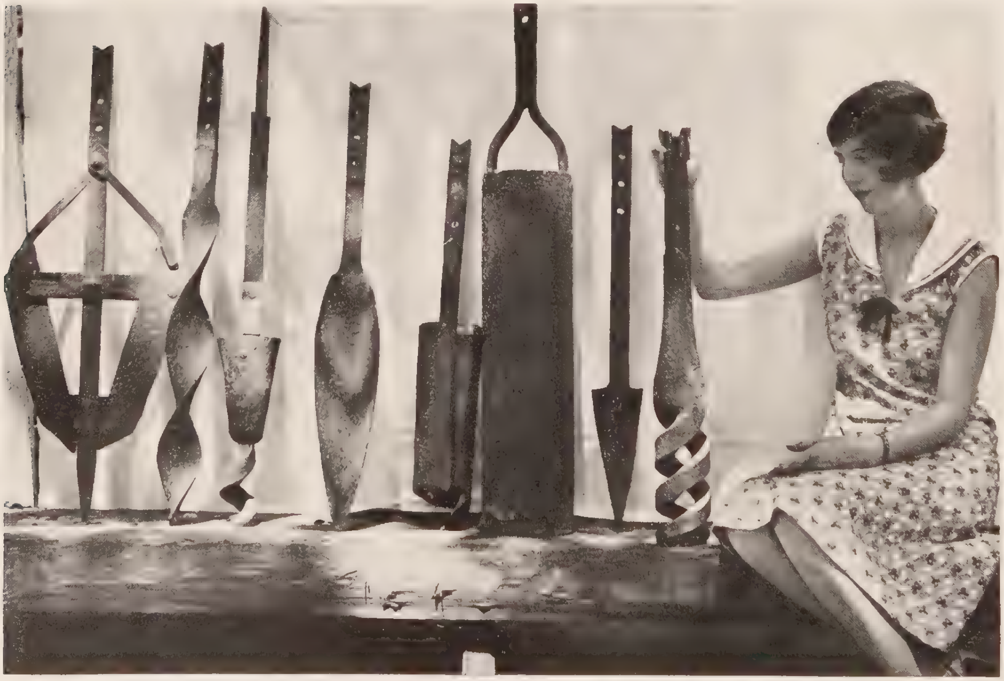
It is inevitable that some day Louisiana's oil fields will be depleted and its gas wells will cease to flow—in the latter case, perhaps within 35 to 50 years—and until a few years ago it was thought that the State's vast timber resources were destined for a rapid decline. Then along came two men of unusual vision. One, operating sawmills at Urania, believed that, by foresight in cutting and safeguarding against fire hazard, natural reforestation would solve the problem. The other, a manufacturer at Bogalusa, who shuddered at the recollection of dead sawmill towns which he had seen scattered all through the South—ghastly skeletons of mills, with piles of sawdust and the remains of smoldering slab pits, surrounded by the tumble-down, deserted huts of former mill workers—sought to thwart the seemingly inevitable by artificial reforestation.

Both methods are meeting with a success far greater than was anticipated, and



A GLIMPSE OF THREE MAJOR INDUSTRIES IN LOUISIANA

In the foreground is a natural-gas well, to the left is the familiar darkey plowing cotton, and in the background is the huge Sterlington electric power plant utilizing the natural gas for fuel (see text, page 448).



HOW THE QUEST FOR OIL STARTED IN LOUISIANA

These tools, part of a full set used in drilling for oil, were made many years ago by a Negro blacksmith on a plantation near Natchitoches (see, also, text, page 443).

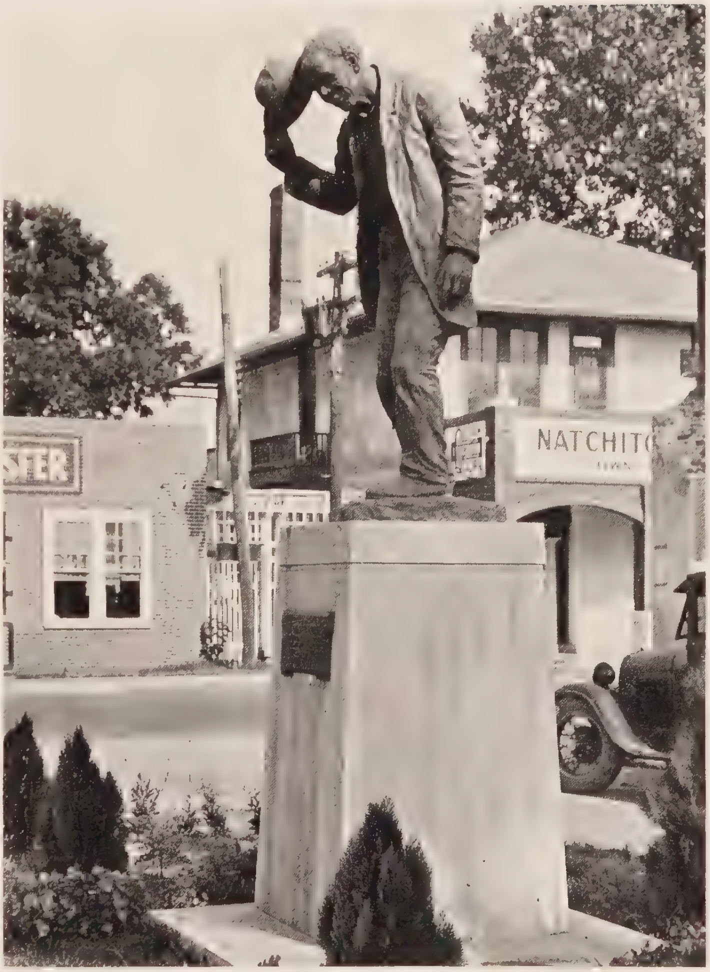
both Urania and Bogalusa have become object lessons for lumbermen and turpentine operators in other Southern States.

The artificial-reforestation undertaking presents more novel features.

Seed of the long-leaf, slash, and loblolly pine are collected throughout the South. Some years the seed crop is heaviest in Texas, some years in Georgia, and sometimes in Florida. These seed are planted in nurseries at Bogalusa. In 1928 the company sowed seven acres of seed beds, in which were raised more than six million seedlings, enough to plant 7,000 acres of cut-over land during the winter of 1928-29.

The seedlings are scientifically planted 900 to the acre. At half-mile intervals adequate space is left for fire-prevention lanes. These lanes are carefully laid out for subsequent use as logging and turpentine roads. The company's timber and prospective timber holdings total half a million acres—a territory three-fourths as extensive as the land area of the State of Rhode Island.

In from 15 to 20 years the slash pine can be cut for pulp wood, and in 40 years for timber; the long-leaf variety requires from 10 to 20 years longer. The plan is to cut a large percentage of the trees for pulp wood, reserve 100 to the acre for timber, and leave some trees for seeding purposes. In the meantime the trees will be worked for turpentine. It is hoped that, once the planted trees are growing and are adequately protected, natural seeding will preclude the necessity for further artificial planting.

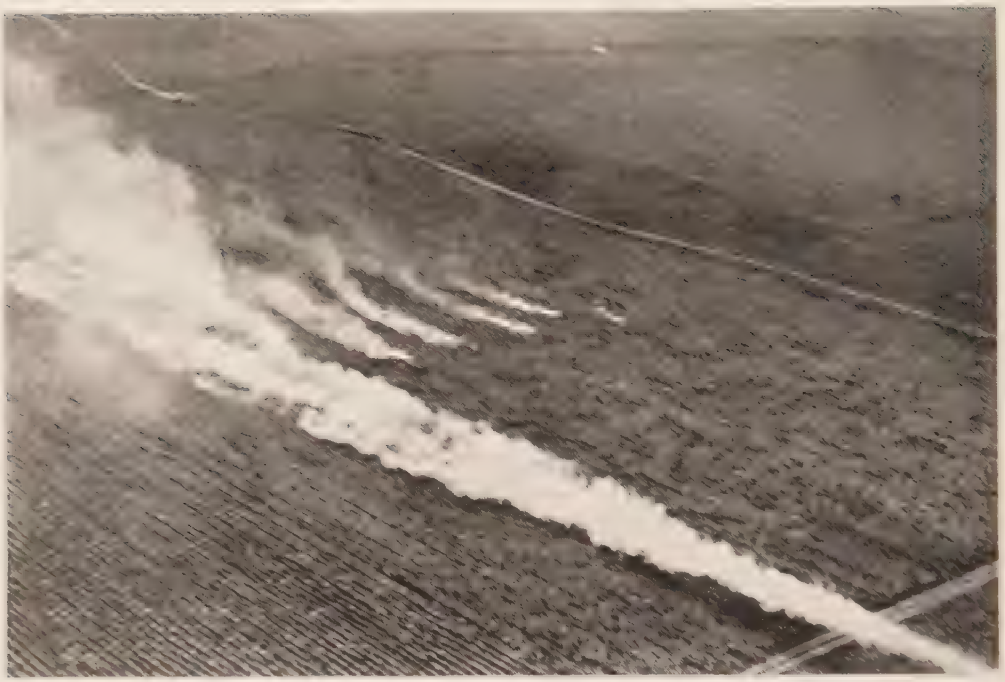


NATCHITOCHES ERECTS A MEMORIAL TO THE OLD-TIME DARKY

It is peculiarly significant that in this Louisiana town, where one group of historians has vigorously promoted the claim that on a plantation near here were enacted scenes upon which the closing tragic episodes of "Uncle Tom's Cabin" were based, and another group of investigators, with equal vigor, has decried such an association, there should be erected this unique statue (see text, page 443).

TIMBER BROUGHT FROM PACIFIC COAST TO KEEP BIG MILL RUNNING

A survey of existing timber conditions has shown that, at the present rate of cutting, the Bogalusa mill, which manufactures three-quarters of a million feet a day and shares with a Longview, Washington, plant the distinction of the largest output of any mill in the world, would



THE AIRPLANE COMES TO THE FRONT IN DUSTING LOUISIANA'S COTTON FIELDS

A comparison in methods. The first small white mark at the right is a man walking and dusting the plants with calcium arsenate. Next to him is a man on horseback, similarly engaged. Then come a mule with a one-row train, one with a two-row "mule duster," another with a tractor, and finally, on the left, the wide cloud wake of an airplane duster. This last method offers a great saving in time and labor and does a thorough job in combating the boll weevil (see page 495).

exhaust its timber supply in 1930, while the newly planted forests will not be in production until 1952. In order to bridge this gap, therefore, the owners put in operation a fleet of five steamers, which now bring squared redwood timbers from California through the Panama Canal to Louisiana. At the present time the mill is obtaining one-fourth of its raw material from the Pacific coast to keep it running at full time.

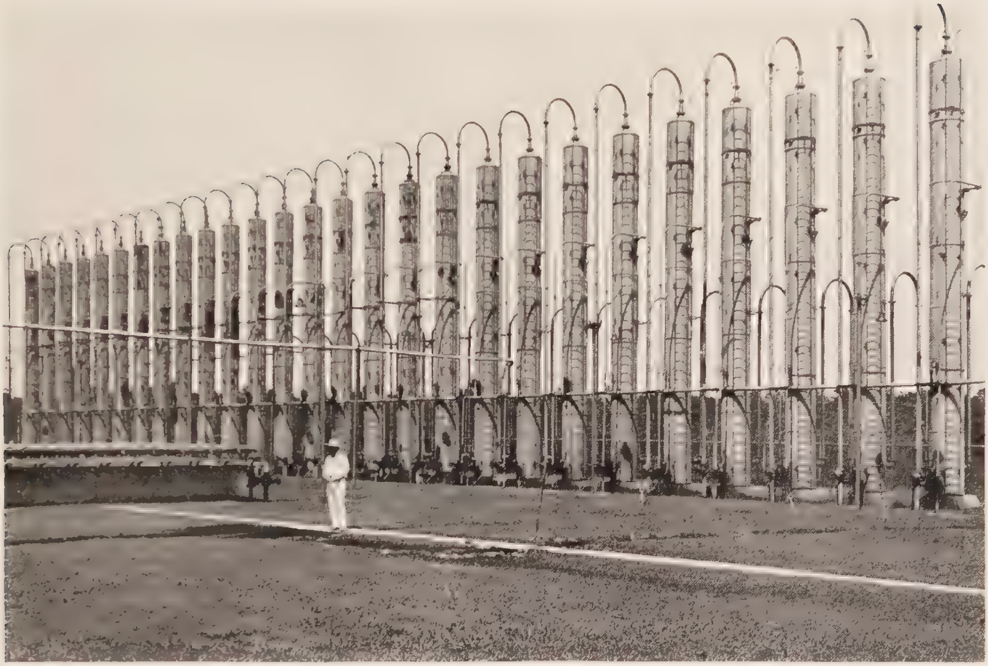
It is a splendid commentary on modern methods to visit a plant like that at Bogalusa. Twenty or twenty-five years ago the first landmark sighted by the visitor to any sawmill in the South was the flaming slab pit, or refuse burner, with its flying sparks constituting the most serious fire hazard of the industry. On the metal side of what was once Bogalusa's refuse burner appears an inscription which tells a unique story of conservation by modern methods (see illustration, page 497).

Automatically stoked, the boilers of the Bogalusa mill now use sawdust for fuel; the trimmings and slabs are sent to an adjoining paper mill to be converted into kraft paper, at the rate of 225 tons a day, and the paper in turn is passed on to a paper-bag factory under the same roof, which turns out two million bags a day. Surplus kraft paper goes to another adjoining mill, which manufactures corrugated boxes.

LOUISIANA'S STRAWBERRY PATCH

Midway between Bogalusa and Baton Rouge lies Hammond, in the center of Louisiana's strawberry district, which produced 33 million quarts of berries in 1928 with a value of more than seven and a half million dollars. Last year's crop was 20 per cent larger, but the value dropped more than two million dollars. It is still too early to say what this year has brought to the producer, for the picking season did not begin until March 15 and will not end until May 10.

The value of the Louisiana berry crop is due in large measure to the fact that

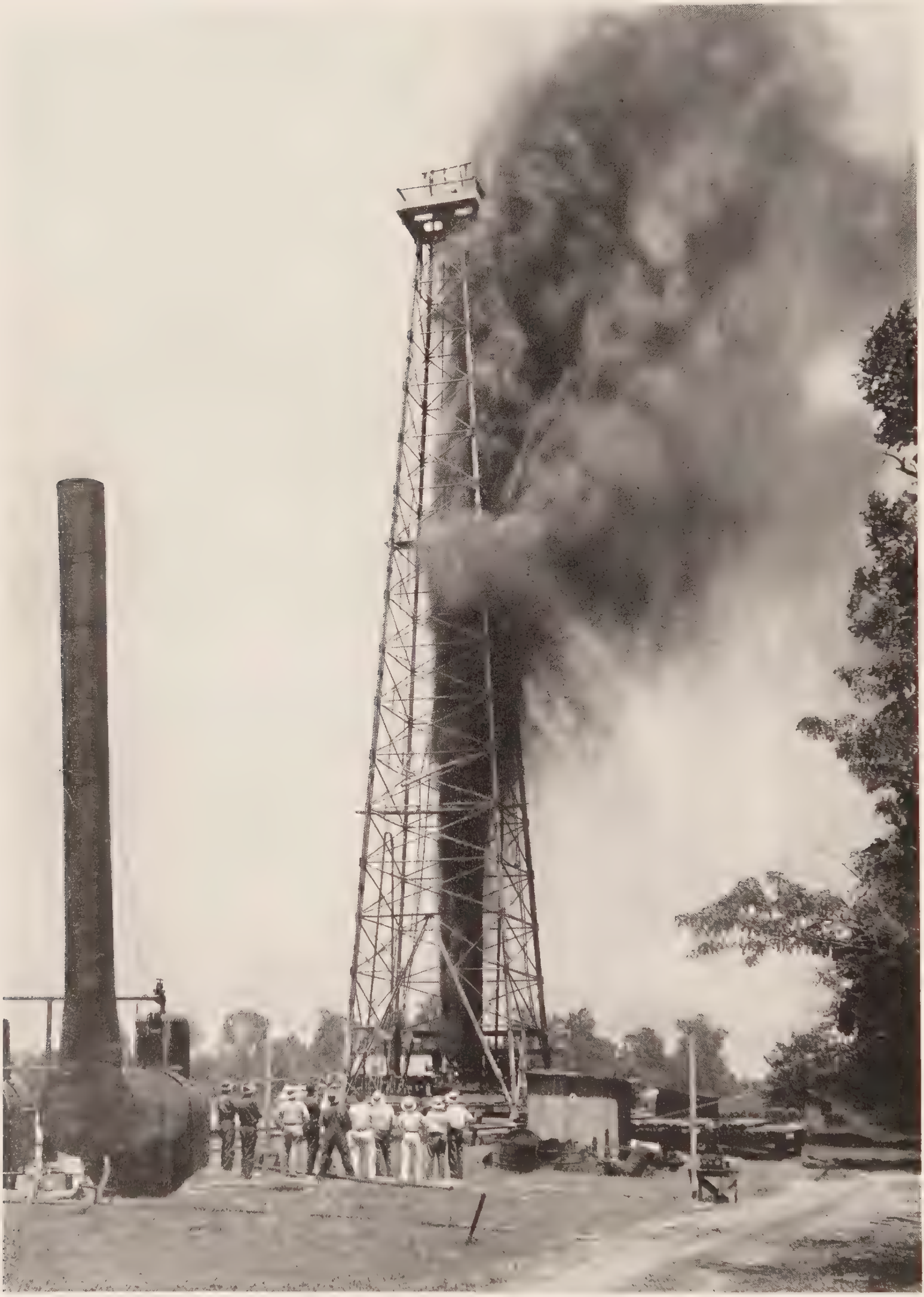


CYLINDERS FOR EXTRACTING A HIGH-GRADE GASOLINE FROM NATURAL GAS

The Monroe field produces a "wet" gas from which a special gasoline is extracted by passing it through absorption cylinders containing mineral oil. The oil takes up the gasoline, which is then removed by distillation, from 175 to 400 gallons being recovered from each million cubic feet of gas. After the gasoline has been "strained out," the gas passes to the carbon-black sheds (see below).

A SMUDGE COVERS THE LANDSCAPE IN THE CARBON-BLACK DISTRICT

A few miles beyond Monroe the sheds where carbon black is manufactured continuously emit heavy clouds of oily smoke (see text, page 447).



"THERE SHE GOES!"

Mud and water being forced from a new well near Monroe by the pressure of natural gas. The boiler at the left provided the steam pressure necessary to keep the drilling tool down while the well was being sunk, otherwise gas pressure would have blown it out. After the well had been drilled to the desired depth and the drilling tool removed, the gas was released for a short time to blow out the mud and water which had accumulated during the boring operations.

Photograph by Walter Layman

A UNIQUE TYPE OF ARCHITECTURE DISTINGUISHES THE LOUISIANA CAPITOL

Baton Rouge, situated on the first high ground—56 feet above sea level—above the mouth of the Mississippi, is not only the seat of the State government, but the home of the State University (see, also, illustration, page 456). Seagoing vessels take advantage of the 35-foot channel to the Gulf and come up to Baton Rouge for cargoes of oil destined for all parts of the world (see text, page 448). The city derives its name (meaning Red Stick) from a large cypress which stood on the site when the French founded it, in 1719, one year after Bienville settled New Orleans (see text, page 458).

the fruit ripens most fortuitously, just when the Florida crop is exhausted and before the crops in other States reach their maturity.

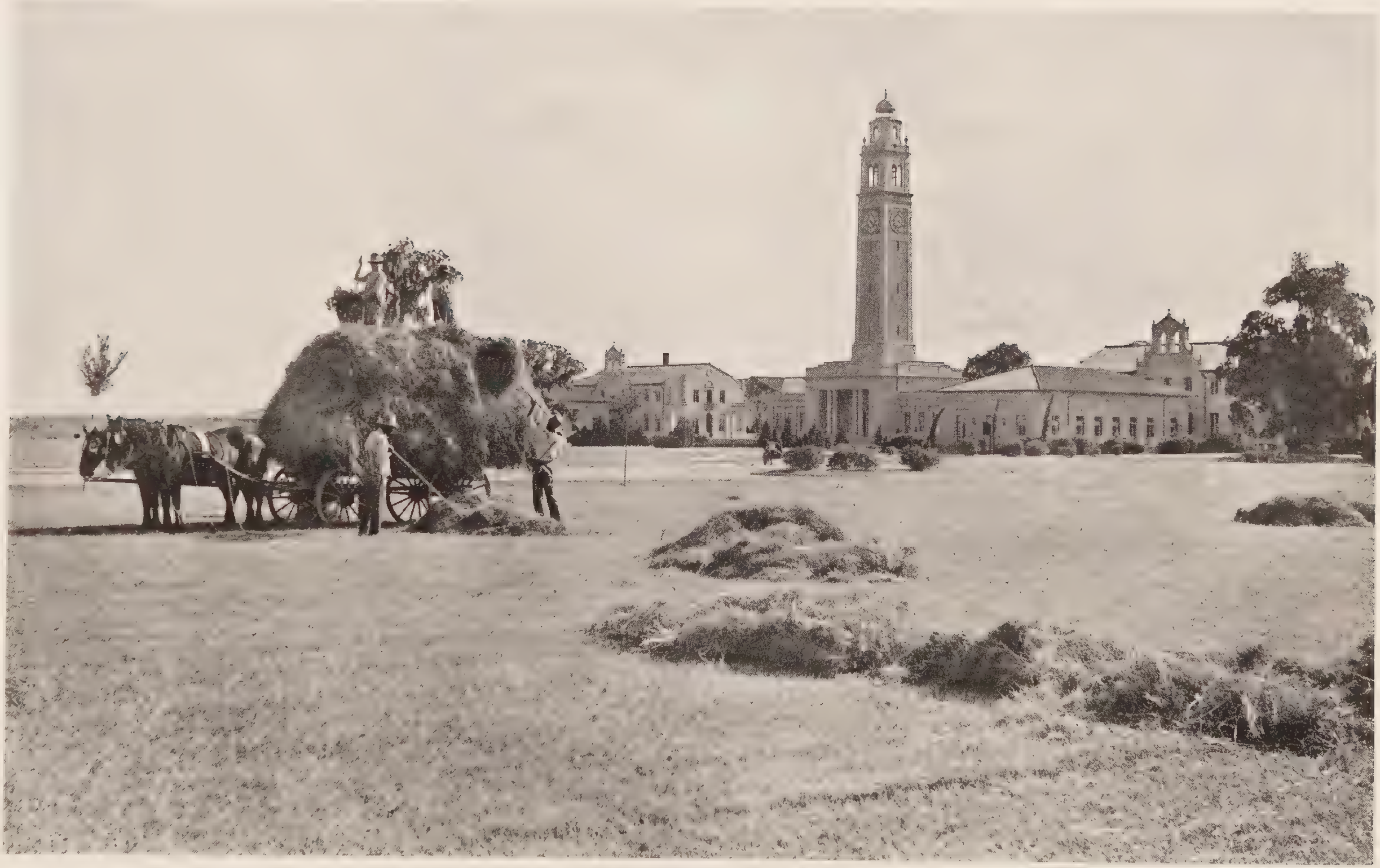
The handling of the crop at Hammond presents one of the most interesting examples of successful coöperative marketing in the country.

When the season opens, buyers flock to Hammond. Day by day they make the round of the fields, inspecting both the quality of the berries and the packing. Each grower has his row bosses to keep strict tab on the pickers, who gather the berries in eight-quart racks, receiving 24 cents per rack. The berries are taken to the packing houses, sorted, and repacked. State inspectors grade the fruit before it is loaded in refrigerator cars.

At the end of the day the buyers gather in Hammond and the three associations of growers auction off the day's pick and pack. The buyers have their records of the fruit which has gone into each car. In the meantime the cars are already on their way north. When the sales have been made, telegraphic orders are sent to divert one, perhaps, to Denver, another to Chicago, and others to Minneapolis, Detroit, or Cleveland.

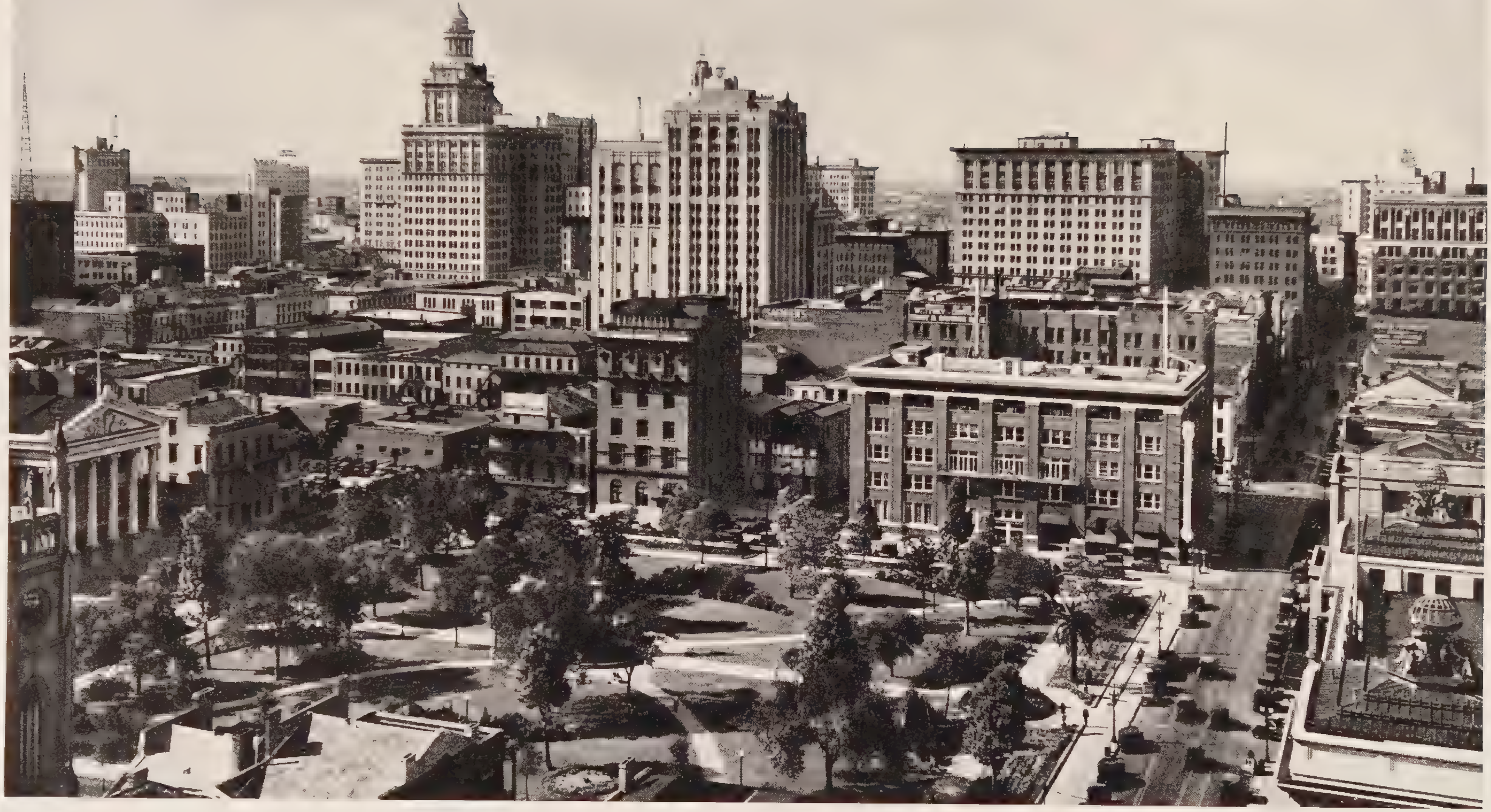
Each grower, who has been given a ticket for his berries as they were loaded into the refrigerator car, gets his proportionate share of the price which that car brings at auction, receiving his check the next morning. There's no waiting for returns from commission men in large cities, no danger (in so far as the grower is concerned) of his shipment encountering a glutted market, with a resultant debit charge for expressage instead of a credit. On the other hand, the buyers, knowing their markets, meet the demands of their customers in the centers of population.

As an evidence of how admirably the system works, it is interesting to note that



GATHERING HAY FROM THE CAMPUS OF THE LOUISIANA STATE UNIVERSITY AT BATON ROUGE

The lofty tower, overlooking the group of new buildings recently erected at a cost of six million dollars, is a memorial to the World War dead. One of the most important branches of the university is its sugar school, with courses in experimental study of one of Louisiana's vital agricultural problems (see text, pages 395-398).



IN THE HEART OF MODERN NEW ORLEANS

The white-porticoed building on the left is the city hall, across Lafayette Square from the United States post office, on the right. On the corner diagonally across from the post office is the *Times-Picayune* building, and a little farther to the left and rear are the offices of the *Item* and the *Tribune*. The tallest structure is the Hibernia Bank Building. All of the large buildings shown in this illustration rest on wooden-pile foundations (see text, pages 473-474).

one of the banks in the strawberry city, with a capital of only $15,000, recently issued a statement showing deposits of $4,000,000.

On my bus ride through this district I encountered school children going to their commencement exercises, for here the school year is from July to March. The younger members of every household are needed in the berry patches when the fruit is ripe, whereas, in the muskrat district, the school calendar must be cut to fit the fur season—November to February.

Thus, economic factors play no small part in the complexities of Louisiana's greatest problem, illiteracy. According to the census figures of 1920, the State crouched at the bottom of the list of Commonwealths, with more than 21 per cent of its population illiterate. As to the effectiveness of the present campaign, inaugurated in 1929 with a first-year's expenditure of $120,000 on the illiterates, only this year's decennial Government census can forecast. But, at all events, the State has awakened to the seriousness of a major handicap.

NEW ORLEANS, CITY OF COUNTLESS FACETS

Wherever the visitor goes in Louisiana, he starts from and returns to New Orleans. He may find it necessary to travel over many States to match in some measure the varied features and resources of Louisiana; he will travel the length and breadth of the land, yet never encounter another New Orleans.

To the commercially minded, New Orleans proclaims itself the second port in the United States—second, that is, in the tonnage of its foreign imports and exports; to the historian, it appeals as a multifold shrine and an inexhaustible source of inspiration; to epicure and gourmet, Paris alone makes as strong an appeal; to the student, it presents three worthy and contiguous institutions of learning—Tulane, Loyola, and Newcomb—and its splendid Delgado Trades School; to the physician, it affords in one of its hospitals an unsurpassed laboratory for the study of tropical diseases; it is at once the despair and the delight of the artist and the antiquary. And, above all, the narrow streets and sheltered courts of its old French quarter—Vieux Carré—distill an irresistible other-world atmosphere of languorous romance.

THE CUP THAT MAKES THE BUSINESS WORLD OF LOUISIANA FUNCTION

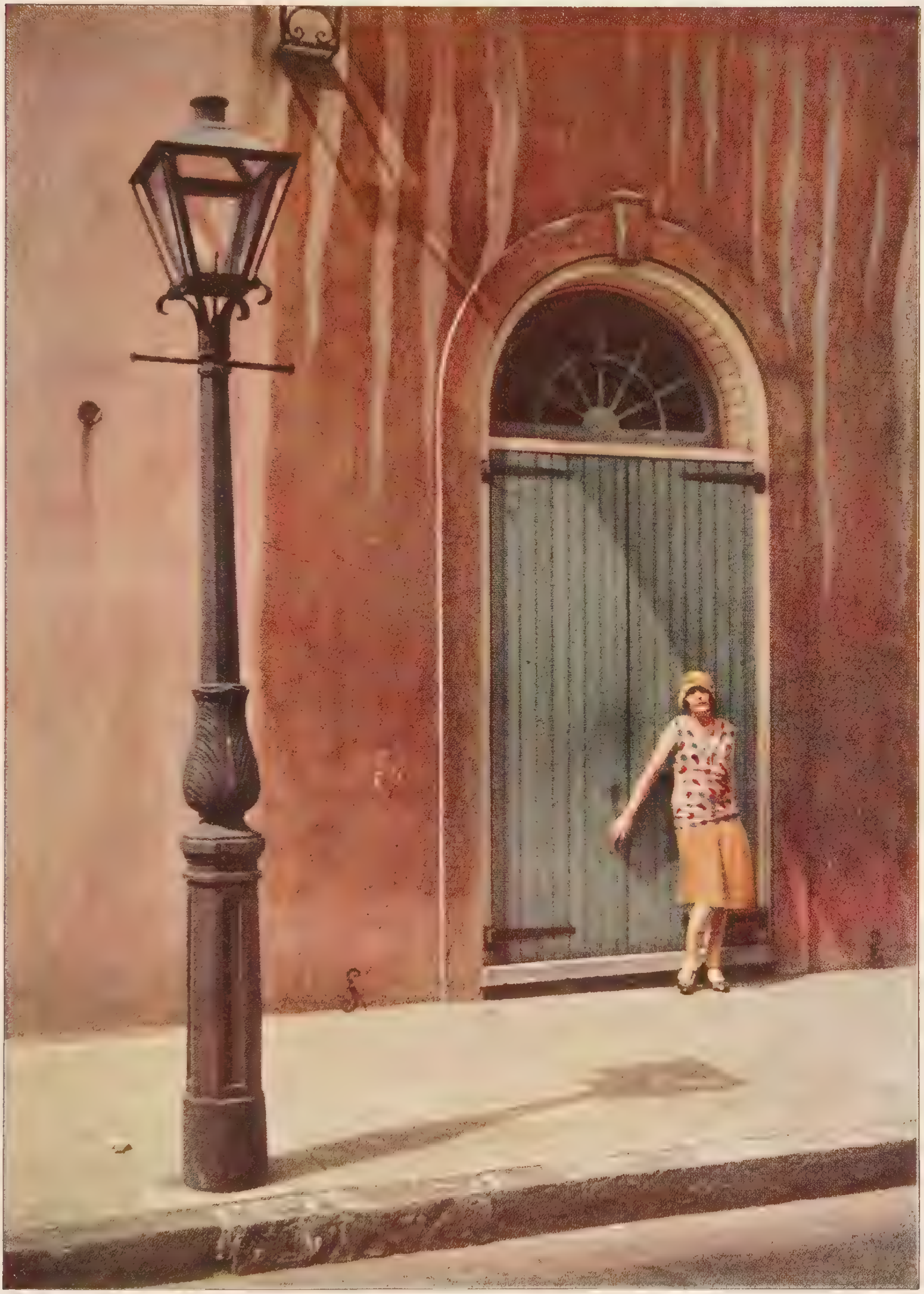
One can imagine that after the astute and adventurous French Canadian, Jean Baptiste Le Moyne, Sieur de Bienville, had selected the site for the future city of New Orleans in 1718, he said to his engineer and city planner, Le Blond de la Tour, "Let's have a cup of coffee while we discuss the details of our new settlement."

At any rate, few affairs of importance or otherwise have been discussed in New Orleans since that historic date except "over a cup of coffee." Here, as in the Near East, business seems to function more easily to the accompaniment of sips of the bitter, black "French drip" than in any other way, and the most harassed executives will pause for ten minutes in mid-morning, leave their offices and go to the restaurant or the hotel in the same or the next block for a cup of coffee—nothing more.

After a few weeks in New Orleans the visitor is led to wonder how the great new two-million-dollar coffee terminal is able to handle the imports of the brown berry for the State's own use, much less provide for the "every third cup consumed by the Nation."

On the top floor of one of the most progressive banks in the State—and in countless other establishments, no doubt—there is a special kitchen and dining room to which the employees retire when the bank doors close to the public at three; after their cup of coffee they return to their desks. In one big manufacturing plant every workman brings with him each morning a small coffee pot, which he deposits under his pet steam-leaking valve, so that, as the condensing hot water drip-drip-drips constantly, he provides himself with small quaffs of the beverage throughout the day.

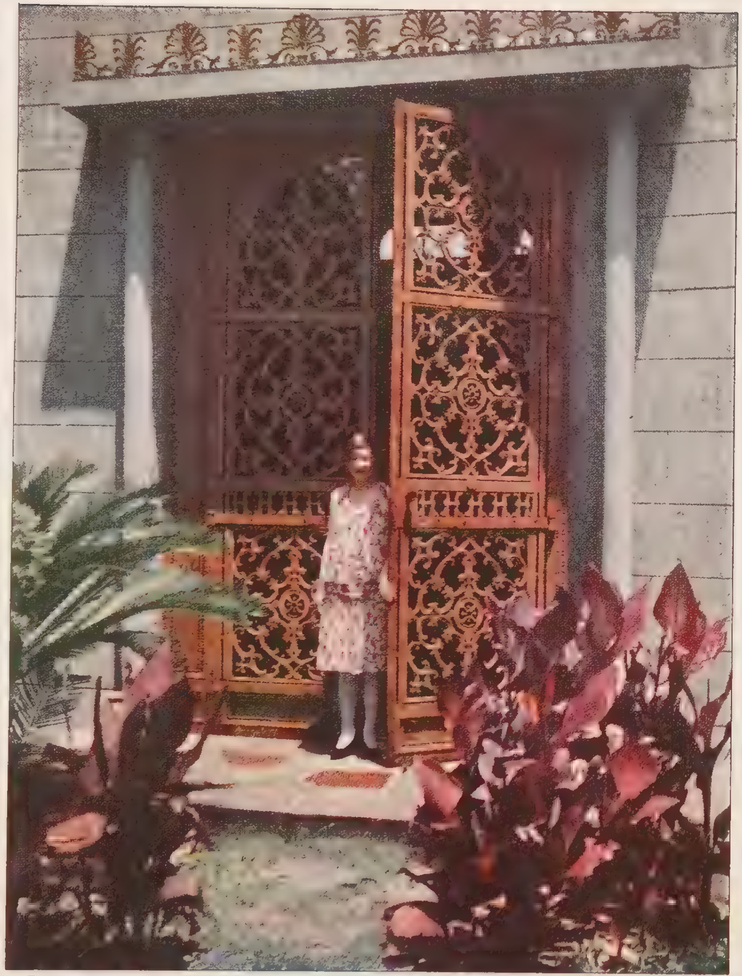
A civil engineer on the *Humphreys* had the steward serve him from six to eight large cups of coffee after dinner each evening, as we sat in the salon and he narrated the romantic story of the Father of Waters, its rampages, its beneficences, and the methods which skilled technicians are developing to tame it to



© National Geographic Society Natural-Color Photograph by Edwin L. Wisherd

AN ENTRANCE TO THE LITTLE THEATER, IN THE OLD FRENCH QUARTER

With 3,500 members, the amateur theatrical organization which occupies this former home of a flamboyant café known as "The Sucking Calf," produces seven plays each season, building its own scenery and making its own costumes. The street lamp in the foreground is a relic of Spanish rule in New Orleans.



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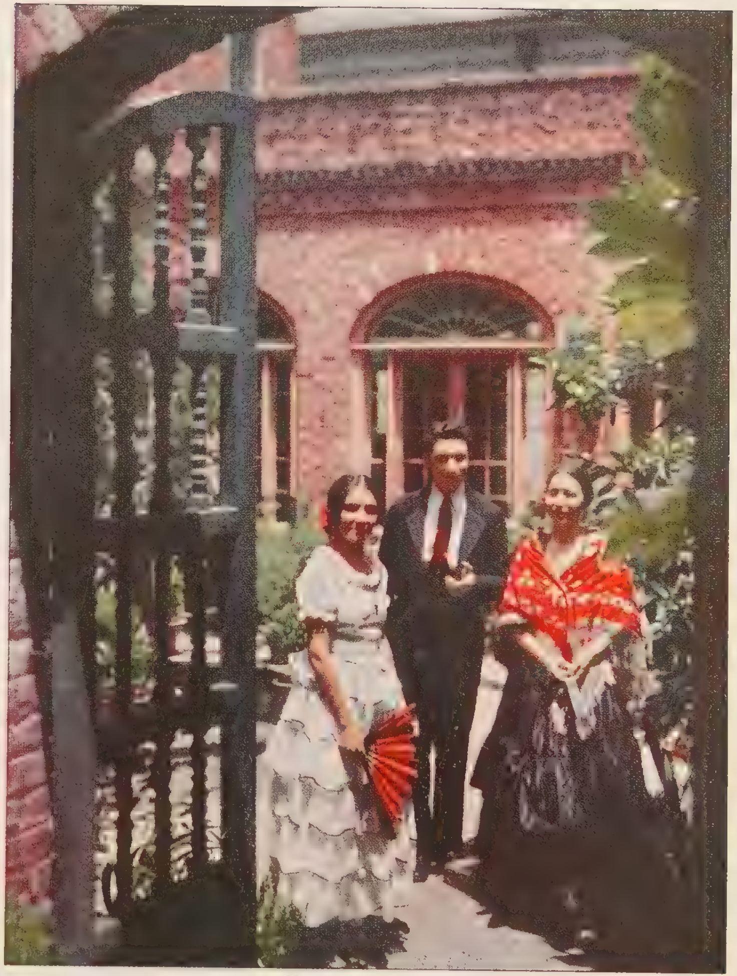
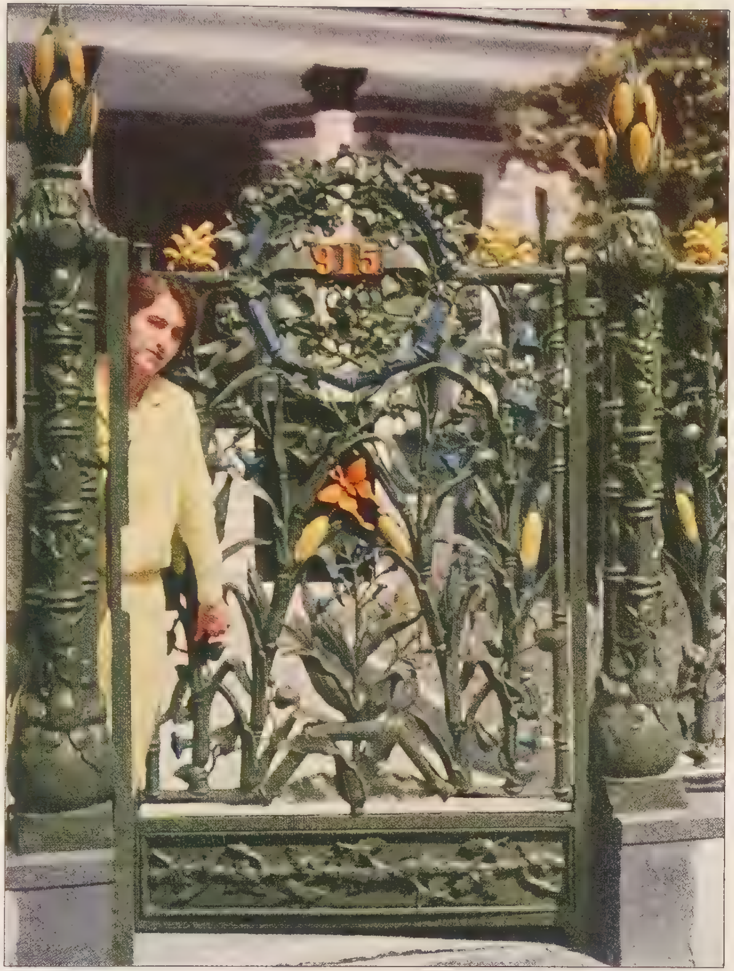
BEAUTIFUL IRON WORK ADORNS MANY HOMES IN THE OLD QUARTER OF NEW ORLEANS



Natural-Color Photographs by Edwin L. Wisherd

THE COURTYARD OF THE LITTLE THEATER, AN APPROPRIATE SETTING FOR CREOLE BEAUTY



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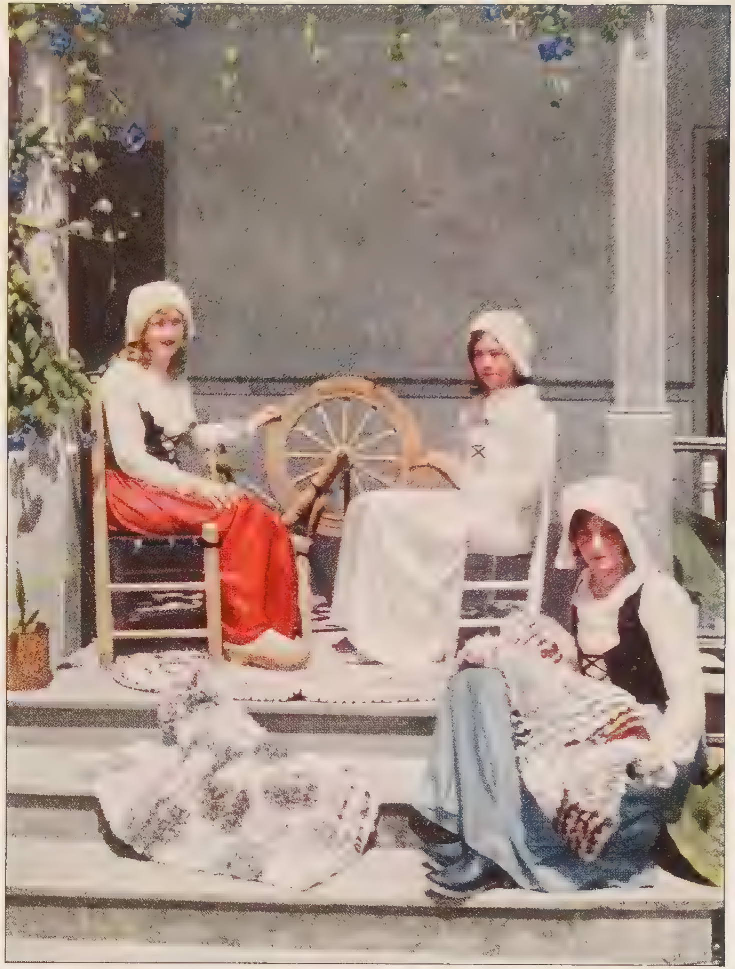
ONE OF TWO ELABORATE CORN FENCES OF WHICH NEW ORLEANS IS PROUD

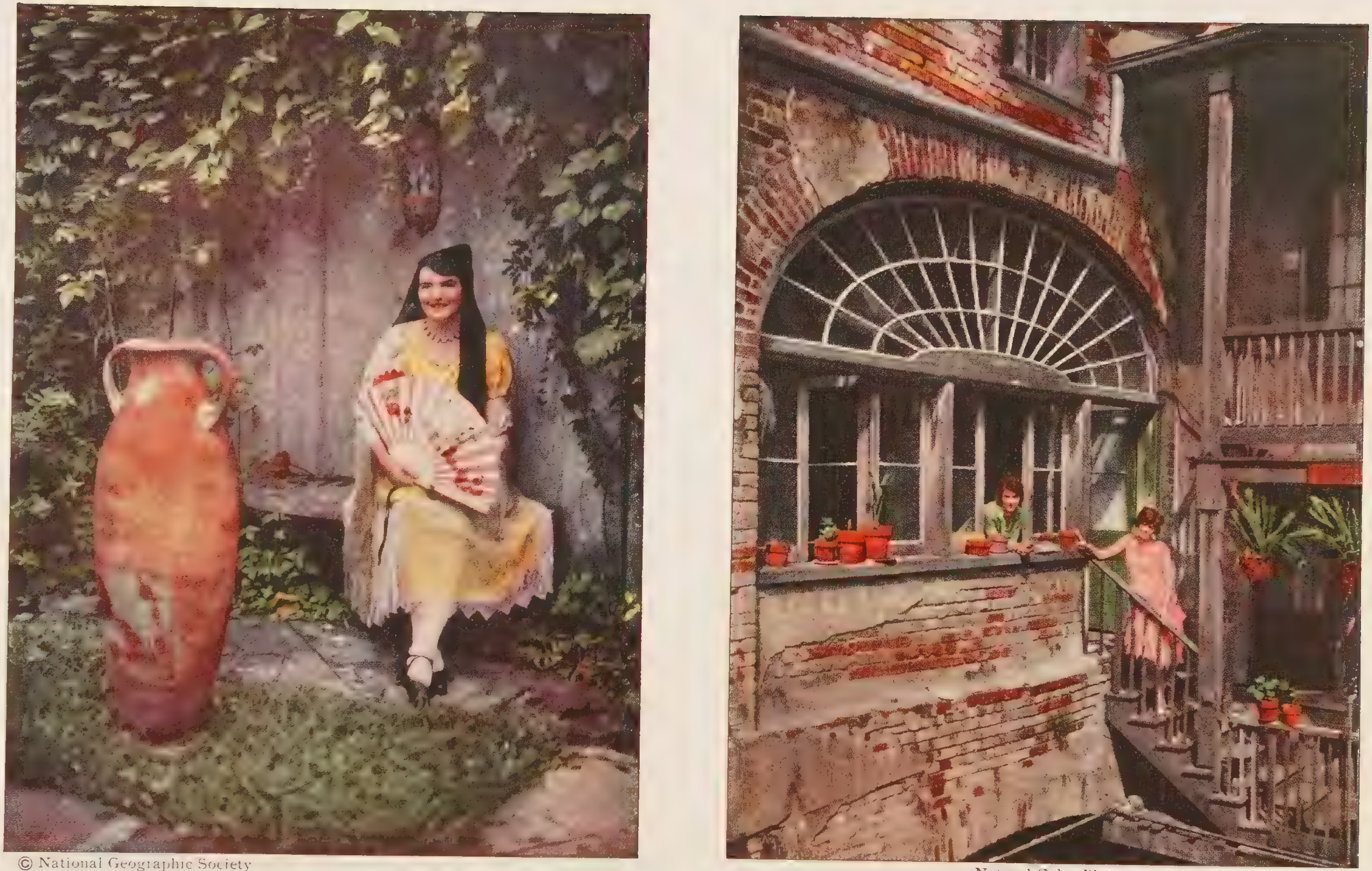
Artistically designed iron work is to be found in many parts of the Crescent City.



Natural-Color Photographs by Edwin L. Wisherd

GIRLS OF ST. MARTINVILLE IN HISTORIC ACADIAN COSTUMES

Old-fashioned rugs made in the Evangeline country are now much in demand (see also Color Plate XIV).



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SUCH CHARMING COURTS AND GARDENS ATTRACT AN ENTHUSIASTIC ART COLONY TO NEW ORLEANS

Many of these beauty spots, in the heart of the French Quarter, now hospitably open to visitors, were formerly jealously closed to the public. The fan window at the right adorns a home once frequented by the city's great. It now provides light for a studio.

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Natural-Color Photographs by Edwin L. Wisherd

FOR MORE THAN FORTY YEARS NEWCOMB COLLEGE HAS FOSTERED THE DECORATIVE ARTS

Going beyond the usual sphere of art-school work, this women's college, now affiliated with Tulane University, has specialized in ceramics, and Newcomb pottery has become world-famous. It is made at the school by professional potters (Newcomb graduates), while the designs, no two of which are supposed to be alike, are originated by the students.

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Natural-Color Photographs by Edwin L. Wisherd

DAUGHTERS OF EVANGELINE ARE ADEPT IN THE ARTS OF THEIR FORBEARS

The Acadians still raise their own cotton, spin it into yarn, and weave the yarn into cloth, much as when first they came to Louisiana in the 18th century. Their beautiful handmade fabrics command a ready market (see also Color Plate XI).

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THE FRAGRANT MAGNOLIA IS LOUISIANA'S STATE FLOWER

Natural-Color Photographs by Edwin L. Wisherd

A KERCHIEFED DARKY SELLS PRALINES IN THE FRENCH QUARTER

ZINNIAS BRIGHTEN THE PATHWAY TO A LAKE CHARLES HOME

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AMERICAN LOTUS ENHANCES THE CHARM OF CANE RIVER LAKE

This lovely waterlily is found in many of Louisiana's streams and lakes, but nowhere in greater profusion than at Natchitoches, the oldest town in the Louisiana Purchase area.

the needs of the people of the Mississippi Valley.

DINING IN THE OLD FRENCH QUARTER

But coffee is not New Orleans's sole contribution to gastronomic indulgence. In no other city in the country is a visitor within the gates invited to dine oftener or more lavishly than here. The Creole tradition has handed down for 200 years the French respect for and art in the preparation of food.

In the old French Quarter, which looms so large in the life of New Orleans, but which in area occupies only a few blocks in this city spreading over nearly 200 square miles, there are half a dozen restaurants whose reputation is nation-wide. Their appointments are not lavish and they are modest in size, but when, for example, one of the Alciatoires welcomes you to his establishment—there are two branches of this family of famous restaurateurs, each a bitter rival of the other—and you ask him to plan your dinner, you will feast upon dishes over which the original Lucullus might have gloated.

The visitor's first impression of his table is that it has a peculiarly "bare" appearance. Then he realizes that salts and peppers and sauces are conspicuous for their absence. When you are served with, let us say, some of those marvelous baked oysters on shells imbedded in salt crystals to keep them hot, and garnished with a mysterious spinach concoction, you may be sure that they are seasoned *exactly* to the taste.

Of course, if you have a "boorish" taste and require more salt, or more tabasco, or more whatnot, you may have it for the asking, but it will not be flattering to your vanity to catch the fleeting glint of contempt in the eye of your servitor, and it is well that you do not hear the comments of M'sieur le Chef when he receives a report concerning your sacrilegious behavior!

Each restaurant has its specialty, be it bouillabaisse à la, et cetera, something or other, a crawfish bisque, a pompano baked in an individual translucent paper bag, or what-have-you. You may or may not wish it; you need not take it. But do not commit the *faux pas* of asking the waiter—or, if you are of sufficient importance to have attracted his interest, the proprietor himself, perhaps—for his advice and then decide upon "a good steak and French-fried potatoes," or something equally banal. The proverbial "fury of a woman scorned" is not to be compared with what you have invited. You may be sufficiently coarse-grained not to realize the heinousness of your offense, for the steak will be excellent and the service will be obsequiously perfect, of course; but if you have sensibilities—!

VAST WATER CRESCENT TOPS THE CITY

In its physical aspects and problems, New Orleans is unique among cities of the United States. It has been built in a vast crescent which the Mississippi describes here, 107 miles from the South Pass outlet into the Gulf (see page 395).

This crescent gives the city special advantages, in that it affords an almost unlimited river frontage for shipping; but it also handicaps the Metropolis of the South in a way that only exceptional engineering genius has been able to overcome.

Practically the entire city lies below the mean level of the Mississippi, and in times of occasional extreme high water the river surface is as much as 22 feet above some sections.

Such conditions not only make necessary the maintenance of great levees to keep the river water out of the city, but entail tremendous problems in disposing of rain and seepage.

To meet these natural handicaps, a corps of engineers has designed a unique drainage pumping system. Experts come from all parts of the world to study its operation. So heavy is the burden which a long, hard rain imposes on the vast network of pipes upon which New Orleans sits, that the pumps must have a capacity of seven billion gallons a day to lift the flood waters out of the city into Bayou Bienvenue and Lake Pontchartrain. In comparison with the entirely separate *water-supply* system, the drainage system could pump enough water in three days to supply the whole city for a year.

The sewage of New Orleans, discharged into the Mississippi below the city, twenty feet below mean water level, requires still a third and independent system, whose modern development has come since 1907. And in the story of its

THE STATUE OF JOHN McDONOGH IS DECORATED EACH YEAR BY GRATEFUL SCHOOL CHILDREN OF NEW ORLEANS

McDonogh, who lived in New Orleans from 1800 to 1817, left a large part of his immense fortune to establish the free school system of the city. According to romantic tradition, he died a bachelor because religious differences separated him from the daughter of Almonaster y Roxas,

A REPLICA OF THE JACKSON STATUE IN WASHINGTON GRACES JACKSON SQUARE, NEW ORLEANS

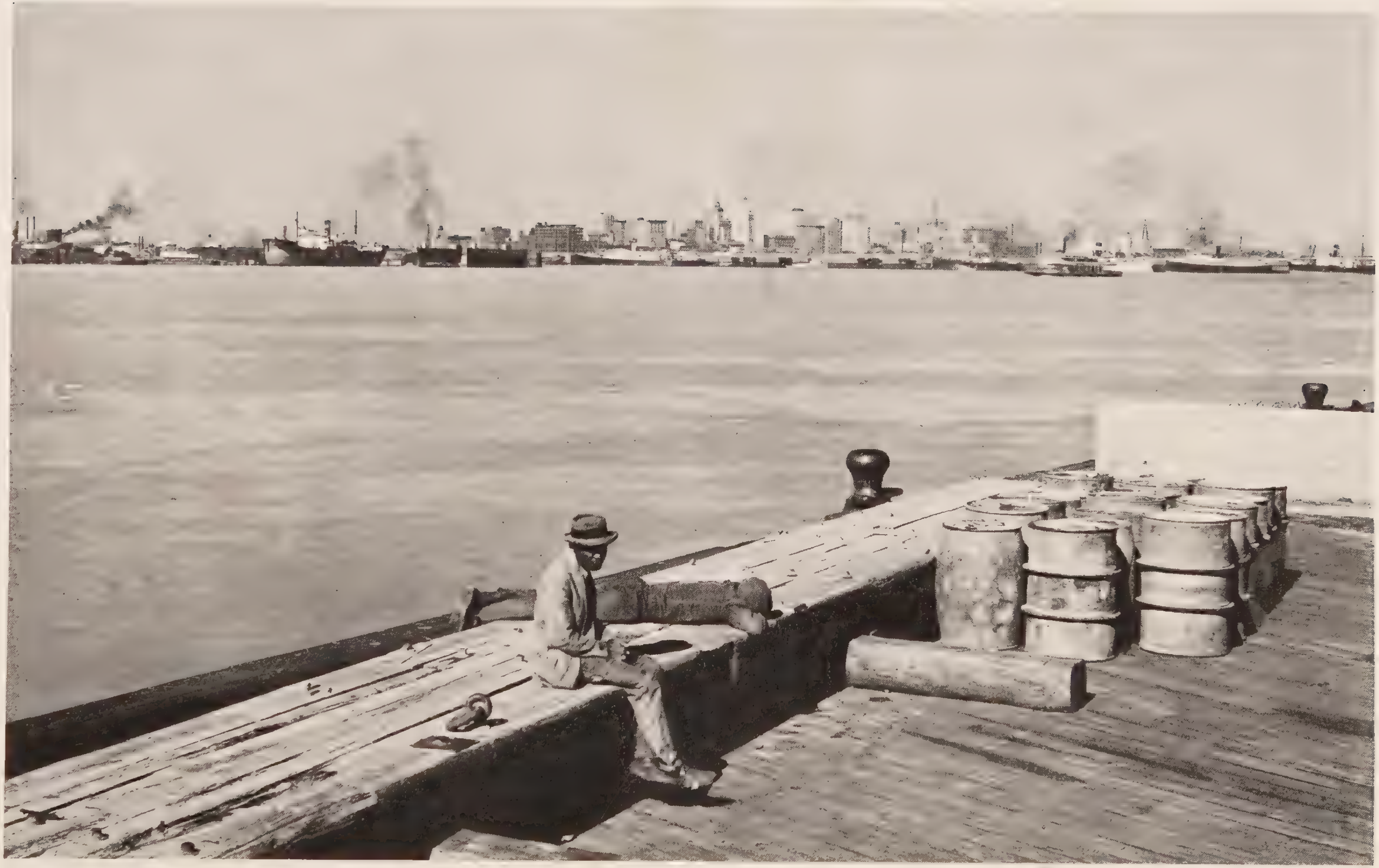
The hero of the Battle of New Orleans is one of the most revered figures in Louisiana history. In the background rises the Cathedral of St. Louis. Don Andrés Almonaster y Roxas, who gave it to the city (see page 481), died 134 years ago, yet every Saturday at twilight services

THE CHALMETTE MONUMENT RISES ON THE SPOT WHERE ANDREW JACKSON'S STANDARD FLEW

Just one hundred years after the Battle of New Orleans, January 8, 1815, this memorial was dedicated. In this engagement on the outskirts of New Orleans, the last battle of the War of 1812, the American forces, comprising less than 5,000 men, met a British force of nearly 10,000, inflicted losses of 2,600, and sustained casualties of only 13 killed and 39 wounded.

THE CABILDO, ONCE THE SEAT OF GOVERNMENT IN LOUISIANA, IS NOW A STATE MUSEUM

It was on the balcony of this building, overlooking the Place d'Armes (Jackson Square), in the foreground, that the French authorities, on December 20, 1803, transferred the sovereignty of the "Louisiana Purchase" to Gen. James Wilkinson, of Maryland, and W. C. C. Claiborne, of Virginia, commissioners appointed by President Jefferson to represent the United States (see, also, text, page 479).



THE IMPRESSIVE SKYLINE AND BUSY WATER FRONT OF THE SECOND PORT OF THE UNITED STATES

The photograph was made from the New Orleans side of the Mississippi, which here makes one of its great bends. In the foreground is a wharf adjoining the banana docks. The photographer stood near the river end of Almonaster Avenue, his camera turned toward the heart of the city (see New Orleans inset of the map supplement).

A HEAD OF CABBAGE GOES TO MARKET

HER MORNING'S MARKETING COMPLETED

An unforgettable experience is a visit to the old French Market in New Orleans. Built by the town council for the convenience of the people, it has been a center of life for more than a hundred years. The rich and the poor, the chef and the housewife, rub elbows here, as they inspect the rich produce of Louisiana's fertile fields and teeming waters.

GARLANDS OF GARLIC

After a visit to New Orleans's famous French Market, one should obtain, by any device however devious, an invitation to inspect the mysteries of one of those restaurants where Creole cuisine is a fine art. Here may be observed the intricate processes by which rare dishes are evolved.

installation lies one of those romances which one encounters on every hand in this city, to which a gifted local historian has so aptly applied the title, "Fabulous New Orleans."

The sewage pumps originally designed for the system developed only 50 per cent efficiency, whereas contracts specified 60 per cent efficiency. The contracting manufacturers, in defense, declared that no pump could be built that would meet the requirements.

Just when this impasse had been reached, a young engineer, recently graduated from Tulane University, appeared on the scene with a set of drawings and specifications for a revolutionary type of pump. He succeeded in convincing the authorities that it might do the work.

An order was placed for the construction of the new pump, but the manufacturers refused to assume any responsibility for the performance of the newfangled machinery. They telegraphed their factory representative in New Orleans that the pump as designed would not "pump." He replied by wire that he hoped it would not; the costly experiment would prove a salutary lesson to city fathers, who were being led astray by a young visionary—a local product.

But the pump did work. And the best part of the story is yet to come: The young engineer, offered many times his then modest salary to go with various manufactories and municipalities, preferred to remain and help to solve other engineering problems for New Orleans. He was given the opportunity to design the bigger pumps of the present drainage system, and thus he has been provided with a great practical laboratory in which to develop his ideas. From his pumps, which are in use in many parts of the world, he receives handsome royalties, and as consulting engineer for another great municipality he receives three times the salary paid him by his home town; but he still occupies the desk of an assistant engineer of the city for which he has accomplished so much.

A WINNING FIGHT AGAINST EPIDEMICS

It is a peculiarity of cities, as it is of individuals, that an initial handicap to progress often stimulates that combative element which ultimately achieves success. New Orleans has given a striking demonstration of this principle in solving some of its health problems. It faced a unique situation in its sewage and drainage systems, owing to the fact that it has no natural drainage into the Mississippi, but rather a seepage from the river into the city. But more than this, because of climatic conditions, all stagnant water in this latitude is a potential breeding place for mosquitoes, especially the species which spreads malaria.

Forewarned has meant forearmed here as in few other cities. The health authorities provide oil-soaked boxes of sawdust through which sluggish exposed ditch and canal waters must pass, thus giving the surface a film which prevents mosquito-breeding. In addition, the department employs a corps of *vigilantes* who constantly patrol the city to spy upon open containers, shallow pools, and even dented gutters in which a few cups of water might collect.

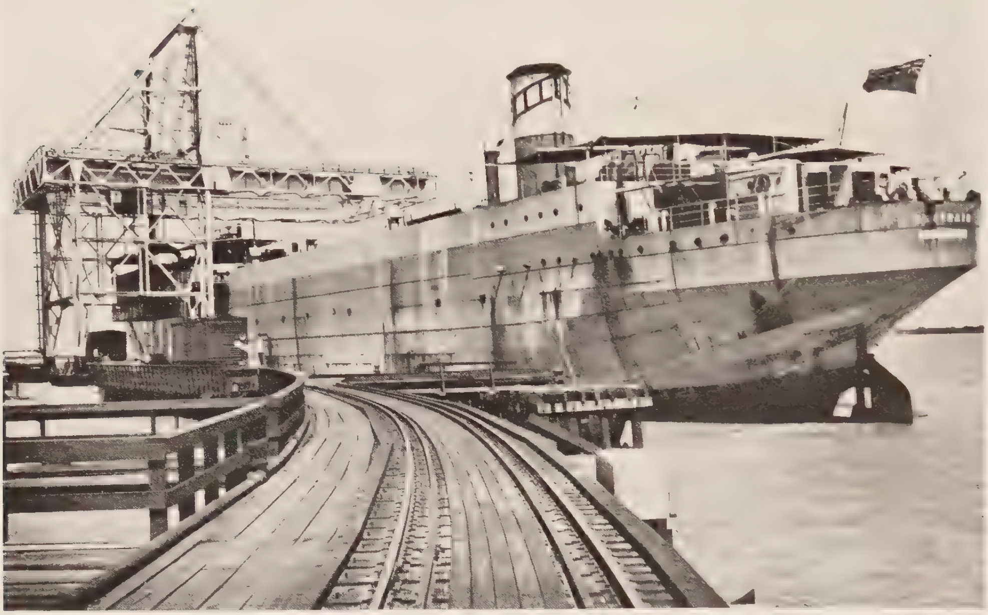
Through such precautions and by careful port regulations safeguarding wharves, grain elevators, and warehouses from disease-bearing rats and mice, the city has triumphed over those diseases of an epidemic nature which one commonly expects to encounter in populous seaports trafficking largely with the Tropics.

A GLIMPSE DOWN ROYAL STREET THROUGH A BIT OF OLD IRON

Such screens were of utilitarian as well as esthetic value, for they prevented possible marauders from going from one overhanging balcony to the next. The sidewalks of Royal Street and other narrow thoroughfares of the French Quarter are called *banquettes.*

LOFTY BUILDINGS ANCHORED TO WOODEN PILES

The geographical location of New Orleans presents difficulties to architects no less than to waterworks and sanitary engineers. The land upon which it rises is the soft alluvial soil brought down through the centuries by the river. There is no bedrock upon which to establish heavy structures, yet the city's skyline is serrated with lofty spires, domes, and airy rectangles.



THE "SEATRAIN" IS A UNIQUE EXPERIMENT AT NEW ORLEANS

Ferries which carry loaded freight cars on one deck over relatively smooth waters are in operation in several ports and are successfully run from Key West to Havana, but in the *Seatrain,* which operates from Belle Chasse, a few miles below New Orleans, to Havana, a new feature has been incorporated. The ship is a large craft with four decks; 95 loaded freight cars can be stowed aboard and so anchored that the vessel can navigate with safety through the heaviest seas. The cars are switched out on a trestle; then lifted by a powerful crane and let down into the hold of the ship, which is provided with tracks. The cars are shifted wherever needed to balance the cargo. A similar crane is required at the other terminal.

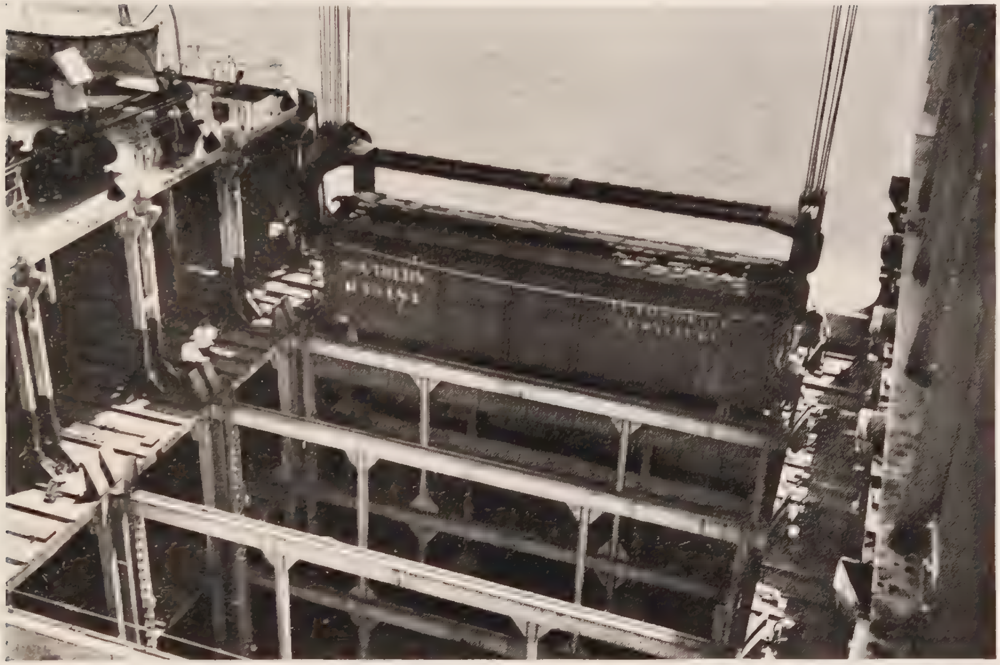
When a big building is projected in New Orleans, instead of steam shovels and blasting drills, a fleet of pile drivers goes into action. Huge creosoted timbers are sunk side by side on the site. In the case of foundations for towering office buildings, hotels, auditoriums, and apartments, these piles are often 80 feet long. Each pile, after being driven down to the ground level, is countersunk to a depth of 10 or 20 feet. Then the top soil is scraped off and the substructure begun on its 80-foot-thick wood foundation.

One magnificent office structure erected within the last five years has already settled several inches, but the walls have sunk uniformly on all four sides, so that there have been no cracks. The stability of the building has not been impaired, but this experience has served as a warning to architects that apparently the limit of safety has been reached, and we are not apt to see here a race skyward for preëminence, such as is now being staged on rock-based Manhattan Island.

THE PINNACLE OF CIVIC GAYETY IS ACHIEVED IN MARDI GRAS

Among the business men who erect and occupy the skyscrapers of New Orleans are many who would like to discount and who would abolish, if they could, that season of gayety between Twelfth Night and Lent which has earned for the community the sobriquet "The City That Care Forgot." They argue that the festivities of Mardi Gras, being merely ephemeral and exuberant manifestations of the Latin spirit which infected Louisiana under the alternate suzerainty of France and Spain in the eighteenth century, convey an erroneous impression of the city's stability.

But these sedate and substantial ones constitute a submerged minority. The



LOWERING A FREIGHT CAR INTO THE "SEATRAIN" (SEE, ALSO, OPPOSITE PAGE)

This method of shipping bulk cargo of a certain class saves the expense of unloading the car, reloading on the ship, unloading the ship, and transferring the freight to new cars at the port of destination. Molasses, muriatic acid, lard, and industrial alcohol can be moved advantageously in tank cars. Sugar was carried in bulk from the Cuban centrals to the great refinery in New Orleans on one of the early trips of the *Seatrain,* but an unexpected complication arose upon arrival. The United States customs regulations provide that "each sack of raw sugar of approximately 330 pounds must be tested for its sucrose content." There were no sacks, and the regulations did not provide for tests except "by the sack." So the whole cargo had to be put into sacks for testing before it could be taken to the refinery, where it was immediately unsacked.

whole country looks to New Orleans to preserve that carnival which has been and which continues to be the model for all such elaborate funmaking, parading, and joyous dancing elsewhere.

And it is in the resplendent pageants of Momus, Proteus, Comus, and Rex, which mark the final triumphant expression of the Mardi Gras spirit, that New Orleans so glamorously renews its youth amid its Old World traditions and its New World responsibilities.

Those responsibilities include the annual handling of some 28 million tons of freight, valued at more than a billion dollars.

THE LONGEST WATERWAY ON EARTH

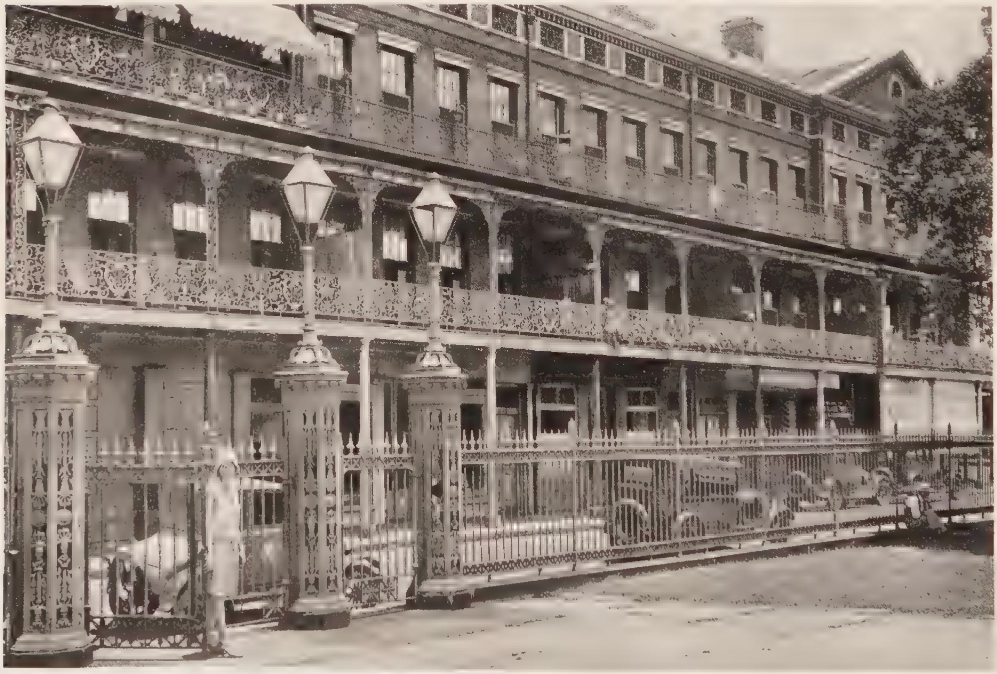
As the commercial funnel of one of the richest, most diversified and populous regions in the world, one does not need the prescience of a prophet to foresee that, important as New Orleans now is, its rapid expansion and increasing prosperity are inevitable. Over the city's magnificent docks, equipped with every modern appliance for the expeditious and economical handling of freight, pass the waterborne exports of the Mississippi Valley with its 13,000 miles of navigable waters, including the Missouri-Mississippi, the longest waterway on earth, extending through some 18 degrees of latitude.

From the great corn and wheat fields of the Central and Middle Western States and the nearer sugar, rice, and cotton fields of the South; from the mining districts of Pennsylvania and West Virginia and the great manufacturing nuclei of Illinois and neighboring States flows a large part of the agricultural and manufacturing wealth of the Nation.

A vital factor in the inevitable growth of New Orleans is its proximity to Latin

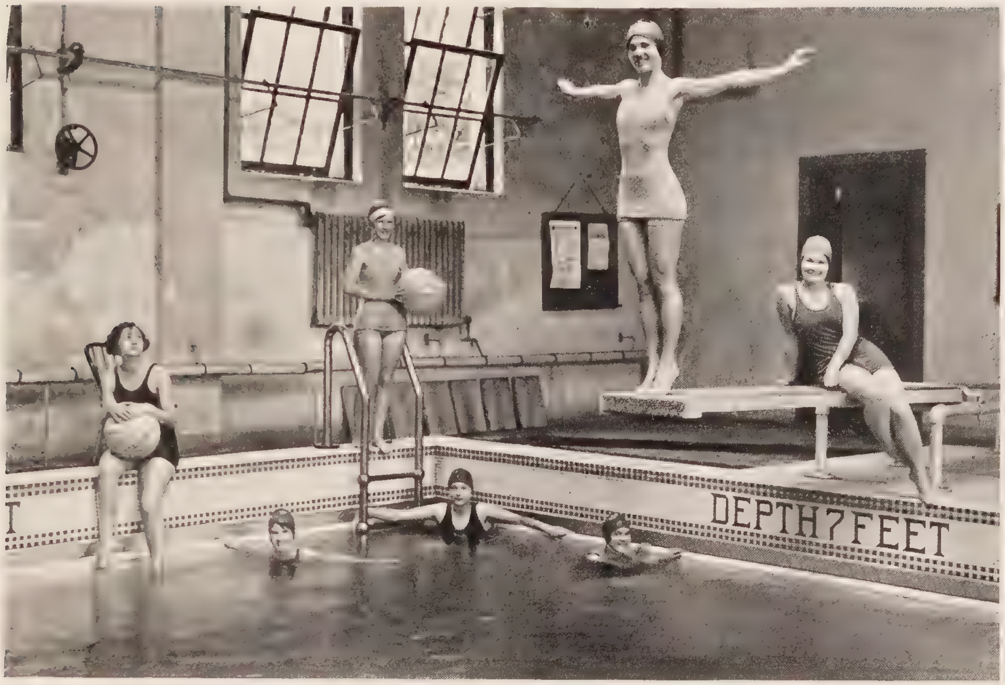
IN THE STOCKS

Minor offenders were confined thus in colonial times. These stocks are now a part of the State historical collection in the Cabildo Museum (see, also, text, page 479, and illustration, page 469).



THE PONTALBA MANSIONS FACE TWO SIDES OF JACKSON SQUARE

Eighty years ago, when these buildings were erected by the Baroness de Pontalba, daughter of the philanthropist, Don Andrés Almonaster y Roxas (see text, page 481), they became the first apartments occupied by the aristocracy of New Orleans. In each section of the iron lacework may be seen the builder's monogram A P (Almonaster-Pontalba).

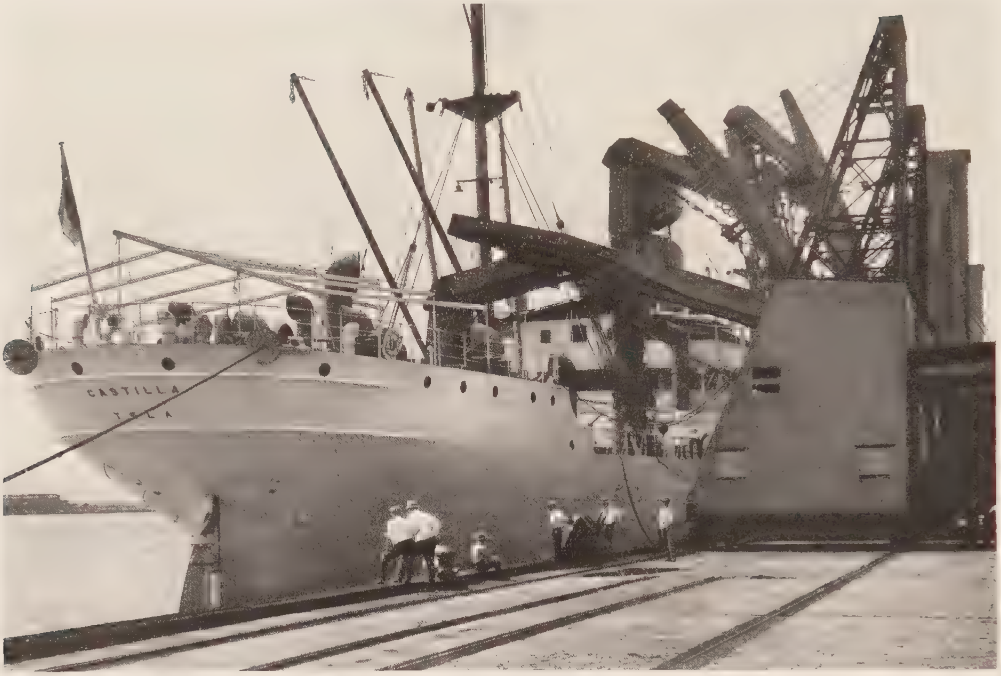


SWIMMING IS IN THE NEWCOMB COLLEGE CURRICULUM

The college-for-women branch of Tulane University bears the name of H. Sophie Newcomb, the only daughter of Mrs. Josephine Louise Newcomb, whose gifts to the institution amounted to three million dollars (see, also, Color Plate XIII).

NEW ORLEANS VISITORS SUPPORT THIS PICKANINNY JAZZ ORCHESTRA

Throngs of diners-out in evening clothes stop on the street corners or order their taxicabs to halt in the narrow thoroughfares of the French Quarter to hear the rhythms of these natural musicians. When the congestion becomes too great, a policeman saunters along and at a signal from the leader the syncopaters seize their tin pans and boxes and beat a swift retreat.



IN EIGHT HOURS THESE CONVEYORS CAN UNLOAD 50,000 BUNCHES OF BANANAS

Endless belts are let down through the hatches of the vessel, and as the bunches are laid gently into their canvas cradles they are borne up to a platform on the dock. Here they are quickly graded, and longshoremen take them to fruit cars switched into position by the city-owned Belt Line, whose 94 miles of trackage connect the docks with every railway entering New Orleans. Within 24 hours of the time that a banana ship is made fast alongside its wharf the entire cargo may be speeding northward toward its destination. Note the two disks around the hawsers at the left to prevent disease-spreading ship's rats from coming ashore.

America. Besides having at its very door the east coasts of Mexico and Central America, Cuba and the other islands of the Caribbean, it is nearly 600 miles nearer to the Panama Canal than is New York, and this, of course, means that it is that much nearer to the entire west coast of Central and South America, with their annually mounting trade.

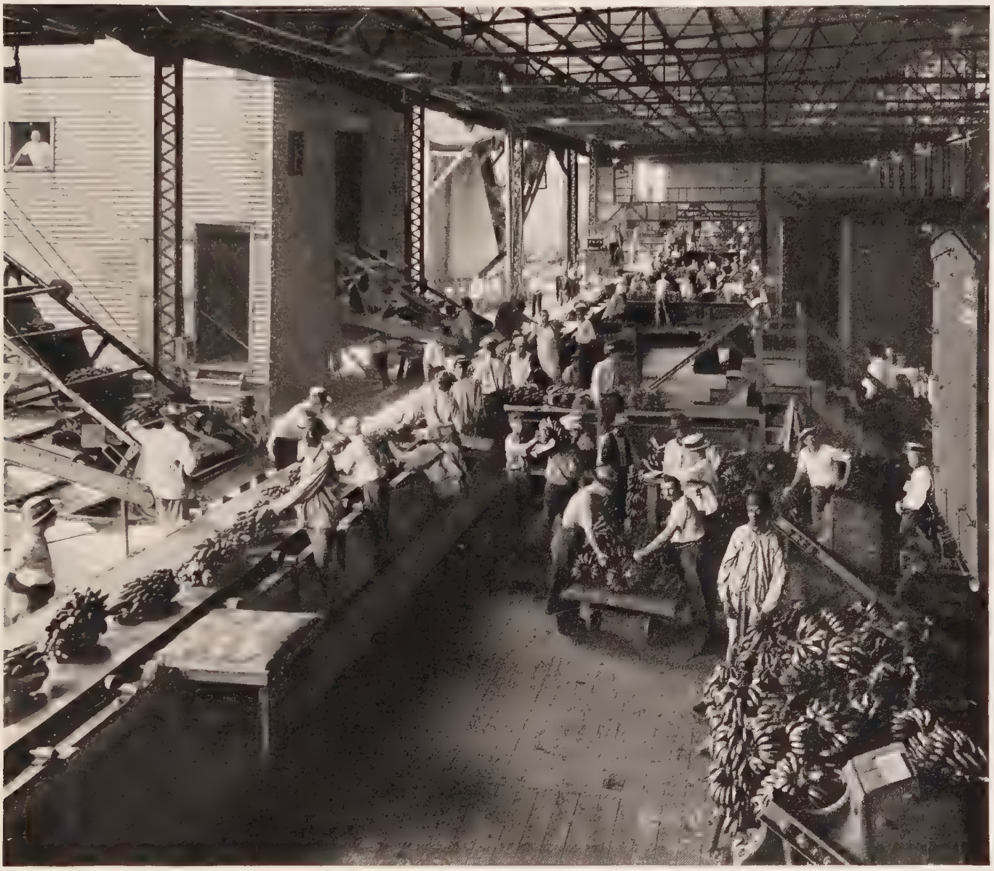
When René Robert Cavelier, Sieur de La Salle, "that virile paragon of early explorers," came out of Canada and, after discovering the Ohio River, led the first voyageurs from the upper waters of the Mississippi to its mouth and gave Louisiana its name, he established a connection between the North and the South of inestimable significance in the history of geographic exploration.

To the man who gave the Louisiana Territory to France, and who, therefore, through the vagaries of statecraft, was indirectly responsible for its becoming a part of the United States, Francis Parkman, American historian, has paid this tribute:

"He was a tower of adamant, against whose impregnable front hardship and danger, the rage of man and of the elements, the southern sun, the northern blast, fatigue, famine, and disease, delay, disappointment, and deferred hope, emptied their quivers in vain. Never, under the impenetrable mail of paladin or crusader, beat a heart of more intrepid mettle than within the stoic panoply that armed the breast of La Salle."

HISTORY RATHER THAN INDUSTRY APPEALS TO THE VISITOR

Few visitors who come under the spell of New Orleans are inclined to think of the city in terms of merchandise and manufacture. Here one finds so much that is matchless in its mellowness that solid statistics are as a dull appendix to an absorbing volume of romance and adventure.



Photograph from H. J. Harvey

HIGH SPEED IS NECESSARY TO SATISFY AMERICA'S BANANA APPETITE

The fruit is unloaded from every hatch and every deck at the same time (see, also, illustration on opposite page). Note the freight cars at the right, ready to receive their cargoes and speed them to various points throughout the South and in the Mississippi Valley.

The very stones of the pavements, many of them brought from abroad, have their fascinating story to tell. Upon the small plot of ground known originally as the Place d'Armes and now called Jackson Square have been enacted some of the most stirring events in American history. Here the French troops were accustomed to parade; here the sovereignty of Louisiana was transferred from France to Spain; here most of the important meetings affecting the lives of the colonists were held; here took place the ghastly executions of colonial times, as when revolting Swiss mercenaries were nailed alive in their coffins and then sawn in two!

Facing the square is the Cabildo, a gloomy building erected in 1794, and used partly as administrative and legislative headquarters and partly as a prison, now a museum with a wealth of historic relics. Here, on November 30, 1803, Spain transferred Louisiana to France, and three weeks later France, in turn, transferred the vast province to the United States.

On the same side of the square rises the Cathedral of St. Louis, on the site selected 210 years ago by Bienville, founder of New Orleans, for the first place of worship in Louisiana. The wood and adobe chapel was obliterated by a tornado in 1723 and was replaced by one of brick which stood for 60 years, until Good Friday, 1788, when a great conflagration swept over the struggling city and destroyed it.

The church was again rebuilt, in much more elaborate and imposing style, and had just been completed, at the end of

RIDING ABOARD WITH ROLLS OF PAPER MADE IN LOUISIANA (SEE TEXT, PAGE 452)

With 41 miles of river front and 11 miles of frontage capable of utilization along the Inner Harbor Navigation Canal, connecting the Mississippi and Lake Pontchartrain, the Second Seaport in the United States has ample room for handling without congestion far more commerce than now passes over its busy docks. Note the anti-rat disk in the foreground (see, also, p. 478).

"LET'S HAVE A CUP OF COFFEE" IS A FAMILIAR GREETING IN LOUISIANA

The interior of the new coffee terminal in New Orleans, through which pass each year from 350 to 450 million pounds of coffee, enough to fill every third cup of this beverage consumed in the United States (see, also, text, page 458).

© H. J. Harvey

THE NEW ORLEANS GRAIN ELEVATOR (FOREGROUND) AND COTTON WAREHOUSE

In modern equipment no American seaport excels the Crescent City. The docks and other port facilities are owned by the State and operated under its supervision. The concrete, fireproof grain elevator has a storage capacity of 2,622,000 bushels. Railway cars can be unloaded at a rate of 200,000 bushels a day, and grain coming down the river by barge can be taken into the elevator at 15,000 bushels an hour. One to four vessels can be loaded at a time, at a rate of 100,000 bushels an hour. The cotton warehouse unit has a compress building, five warehouses, and sorting platforms. Half a million bales pass over its wharves in a season.

five years, when another great fire decimated the city. This time, however, almost as if by a miracle, the cathedral escaped. Seventy years ago the principal tower fell, necessitating elaborate alterations, but the major portion of the building (see page 468) is that erected through the munificence of Don Andrés Almonaster y Roxas, public benefactor in the days of Spanish supremacy.

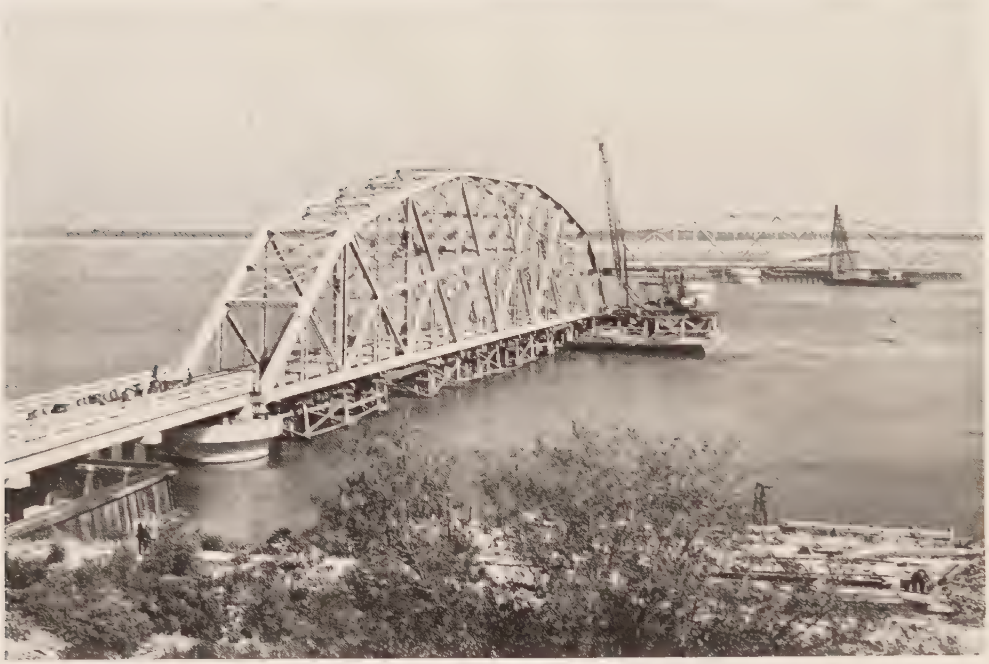
Near by, one is shown the house built for Napoleon when a daring scheme was hatched to rescue the exiled Emperor of the French from St. Helena and give him an asylum in the New World. The prisoner died before the rescue was attempted.

CARNIVAL CROWDS WILL DANCE WHERE VOODOO RITES WERE ONCE HELD

On Congo Square, where voodoo rites were once practiced, and where 11 Italians were slain in the notorious riots which caused international complications 40 years ago, now rises a great Municipal Auditorium, with a seating capacity of 12,000. Here the famous balls which are a feature of the Mardi Gras celebrations were held for the first time this year. For 60 years prior to its destruction by fire, in 1919, these balls had been held in the old French Opera House.

But not all interest in New Orleans is focused in the French Quarter. The city's beautiful parks, with their moss-festooned live oaks, their lakes, and bathing pools, are among the finest in America.

Its cemeteries are places of pilgrimage for visitors, who find among the aboveground vaults and mausoleums a suggestion of the ancient Appian Way, along which imperial Rome entombed its noble dead. Of a likewise melancholy interest are the beautiful and historic Dueling Oaks in City Park, where "coffee and



Photograph from Francis L. Pullen

THE TOLL-FREE RIGOLETS BRIDGE NEARING COMPLETION

This structure, which spans The Rigolets, an outlet of Lake Pontchartrain to the Gulf, when finished, will open a free automobile route into New Orleans from the north and east. In the meantime the State is operating a free ferry across the lake. The shorter route is over the toll bridge, owned by private capital (see illustration, page 400).

pistols for two" have been served so often—ten times on a single Sunday morning on one occasion many years ago.

From the river to the New Basin Canal runs that colossus among commercial highways, Canal Street, with its four street-car lines, a parkway in the middle, two wide one-way thoroughfares, and fantastically broad sidewalks. At a cost of millions, the city has recently rebuilt it completely. Refurbished and relighted, it proves an ideal parade ground and open-air center for all the extravagant gayeties of Mardi Gras (see illustration, page 397, and text, page 474).

Roughly paralleling the crescent formed by the Mississippi, Magazine Street, St. Charles and Claiborne avenues run concentrically and cut through Audubon Park and the campuses of Newcomb College, Tulane and Loyola universities.

Lovely, broad-verandaed homes with spacious grounds, from which spring lofty palms, flowering azaleas, flaming hibiscus, white and coral japonicas, and oleanders, distinguish the residential sections of the avenues.

But why attempt to appraise or describe New Orleans? Only a great engineer, a great architect, a great artist, a great philosopher could do the subject justice.

And the city is the concentrated spirit and substance of the State.

Additional copies of the Map of Louisiana, which is issued as a supplement with this number of the NATIONAL GEOGRAPHIC MAGAZINE, *may be obtained, either on paper or on linen, at 50¢ and $1.00, respectively, by members from The Society's headquarters, 16th and M Streets, Washington, D. C.*

KEEPING HOUSE FOR THE "SHEPHERDS OF THE SUN"

BY MRS. WILLIAM H. HOOVER

I REFUSED to go to the mountain. To Keetmanshoop? Yes! But as the person chiefly responsible for Betty I put my foot down. I wouldn't budge an inch unless a cow went with us.

I was all for solar-radiation observations and fresh milk, but if the two could not be combined, then Betty and I would stay at Keetmanshoop and Mount Brukkaros would be womanless.

Two months previously four of us—Mr. Hoover, Mr. Fred A. Greeley, Betty, eighteen months old, and I—had sailed out of New York harbor on a three-year scientific expedition. Mr. Hoover and Mr. Greeley had been designated by the National Geographic Society, in coöperation with the Smithsonian Institution, to set up and operate a solar-radiation observatory on Mount Brukkaros, a lonely volcanic mountain that rises from an arid plain of South West Africa.*

We had journeyed by rail a thousand miles from Cape Town to Keetmanshoop (see map, page 489). The Government of South West Africa had built for us a corrugated iron house on the mountain top and a road had been leveled halfway up the four-mile slope to a garage for our truck. The Government had also strung a telephone line for 60 miles, from Keetmanshoop to Brukkaros, and two wagons, each drawn by 12 pairs of oxen, had carried the observatory instruments and house furnishings to the mountain. The place was complete, except for a cow.

MISADVENTURES WITH THE BABY'S COWS

Buying a milch cow in South West Africa is not so simple as it sounds. Because of the drought, none of the cows on the Hottentot Reserve surrounding the mountain were giving milk. We found one at last—120 miles from the mountain! It took the native boy a whole week to drive the cow and her calf 60 miles to Keetmanshoop, where I insisted that the veterinary examine her for tuberculosis. The remaining 60 miles to Brukkaros occupied another week.

They got the cow as far up the mountain as the water hole (still one mile short of Observatory House), and then she refused to budge. We tried everything. We took the calf up to the house. Her frantic bellows were enough to soften any ordinary bovine heart. But no. The path was too steep for a tired and much betraveled mother. So, after two days, we had to take Belinda, the calf, down to her mother who was still firmly established at the water hole.

Perhaps we could get cow and calf together up the trail? Mr. Hoover pushed. Mr. Greeley pushed. They chased and threw rocks. The Hottentot boys assisting advised that twisting the tail will make any donkey, ox, or difficult animal step out when all else fails. So they twisted the cow's tail, but even then she wouldn't go up the trail.

There was nothing to do but for the native boy to go down the mountain every day and milk her. The second time down he reported that she had gone wild and he couldn't milk her. A week later he reported that the cow was dead. We think a snake bit her.

Her successor—for I still insisted on fresh milk as an essential to housekeeping with a baby on an arid mountain—was never allowed so much as to pause at the water hole. She was rushed straight to the top of the mountain.

Not the least of the chores at Brukkaros was the task of bringing water for the precious cow up the narrow trail on donkey back every day from the water hole. At last, we congratulated ourselves, our dairying experiment was a success. Short-lived, it turned out; Cow Number 2, reaching for an especially difficult clump of grass, fell and broke her leg and had to be sent to her forefathers.

So the third cow was brought. She calmly adopted the calf of her predecessor and furnished us regularly with about two

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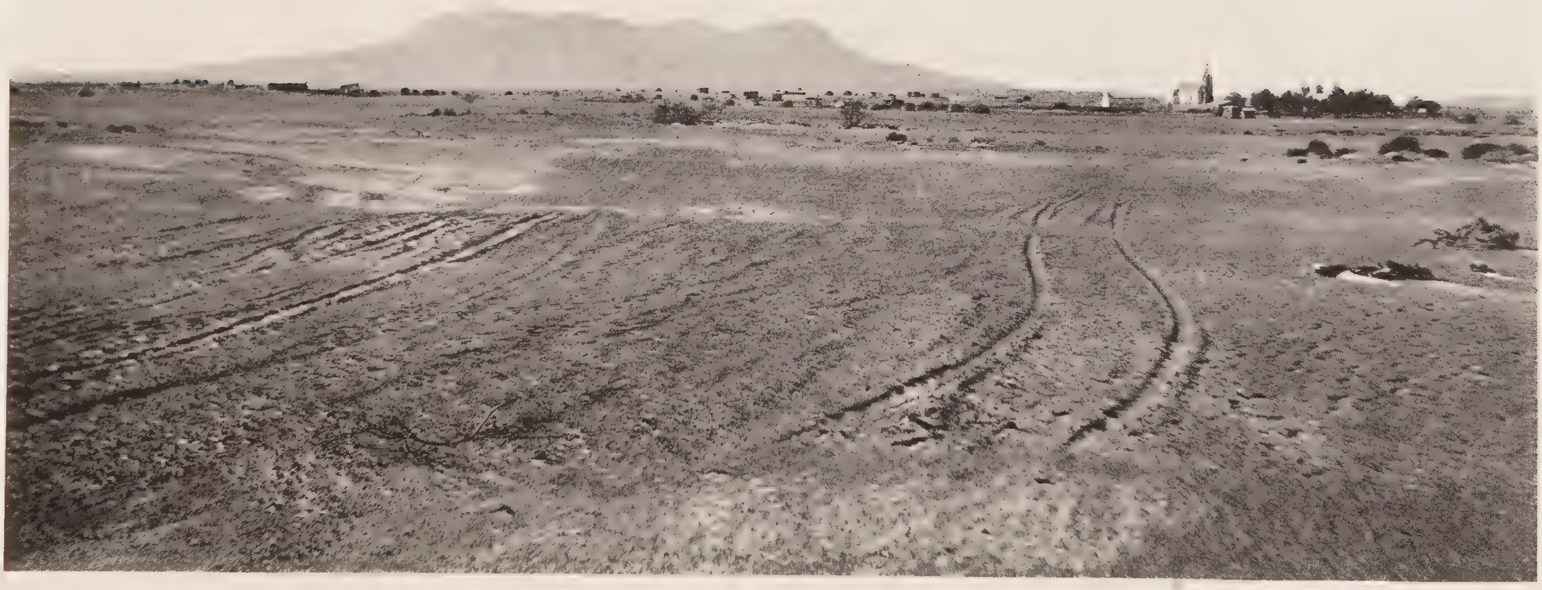
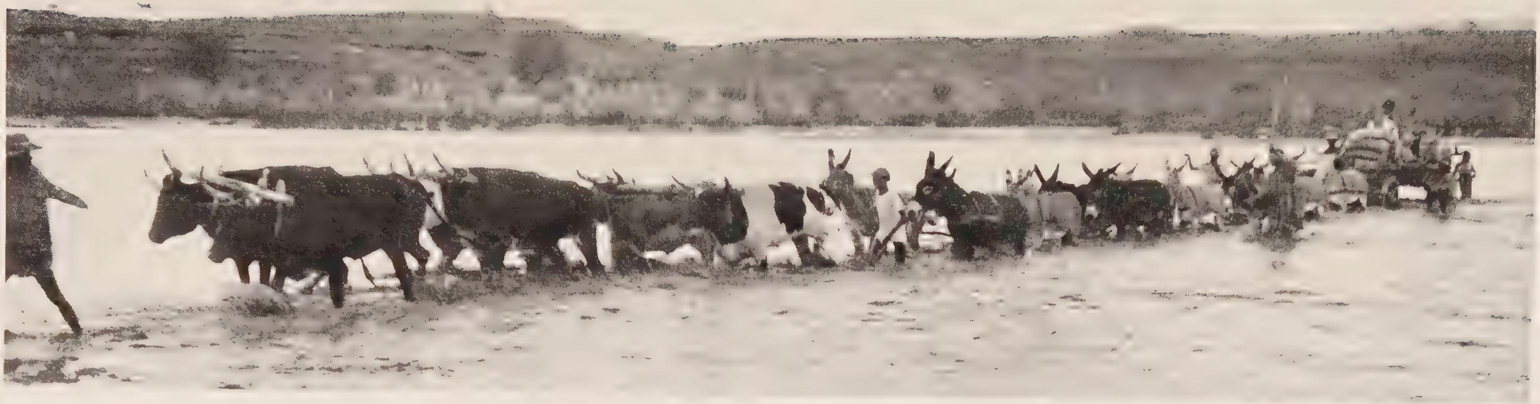
* See, also, "Hunting an Observatory: A Successful Search for a Dry Mountain on Which to Establish the National Geographic Society's Solar Radiation Station," by C. G. Abbot, in the NATIONAL GEOGRAPHIC MAGAZINE for October, 1926.



Photograph by William H. Hoover

MOUNT BRUKKAROS LOOMS BLUE AND MYSTERIOUS BEYOND BERSEBA

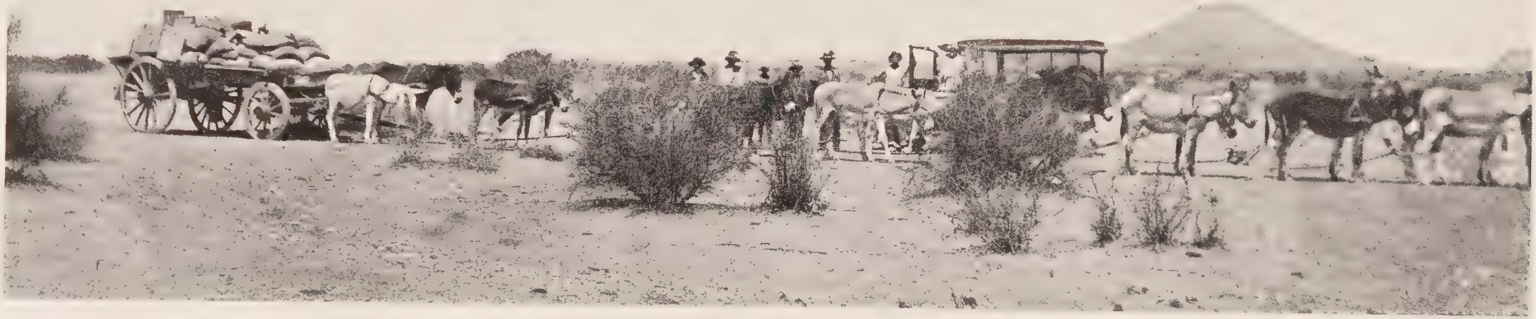
Low, black hillocks scattered over the desert are the homes of Hottentots. They attend services in the Lutheran Church, which is presided over by a German missionary and his wife, whose house is buried in the grove of trees at the right. The missionary family, by irrigation, raises all sorts of delicious fruits and vegetables in their oasislike garden (see text, page 489).



Photograph by Fred A. Greeley

BRINGING SUPPLIES TO BERSEBA REQUIRES NEARLY AS MANY ANIMALS AS A CIRCUS PARADE

Despite the numerous animals used, wagon freight is still cheaper than motor-truck transportation. Taxi fare from Keetmanshoop to Mount Brukkaros is $50. Gasoline sells at 80 cents per British gallon (nearly five quarts).



Photograph by William H. Hoover

A 20-MULE-TEAM SUPPLY WAGON MEETS THE OBSERVATORY AUTO TRUCK

Comparing old and new methods in Africa: The wagon will carry a load of 4 tons; the truck three-fourths of a ton; but the Berseba wagon takes three days to go to Keetmanshoop; the truck four hours.

quarts of milk a day. When the pasturage on the mountain was scarce we carried up alfalfa for the cow and her family, and Betty grew and grew and kept her rosy cheeks.

But before we had gone to the mountain, Betty and I had had to wait ten weeks in Keetmanshoop while things were being made ready. We discovered how delightfully informal and hospitable people in South Africa are to strangers. We were at the hotel three weeks when we were taken into the very hearts and household of a family. Betty had been having dysentery, so we were glad to get away from the hotel with its swarms of flies.

ONLY BUSINESS HOUSES HAVE TELEPHONES

We had learned that life in this part of South Africa is not so very different from that in a small Western town of the cattle- or sheep-ranching country at home. There were wide, sandy streets and rambling, one-story cement or adobe buildings with broad verandas; peppertrees, oleanders, bougainvillæa, and geraniums in tins. All the drought-resisting or irrigation attempts at gardening seemed pitiful and wholly without background to one brought up in Westchester County, New York.

Bright, bright sunshine with a glare over everything. We were amazed at the abundance of stores, thirty or forty, ranging all the way from the large general merchandise establishment to the one-room, family-managed variety; and only 900 whites in the whole district. We counted six churches and four tennis clubs. There were movies once a week at the Railway Institute, a sort of community house for railroad employees.

The one big difference was the presence of the natives. We met tall, dignified black Herero women carrying bundles of clothing, sacks of meal, tins of water on their heads—once a girl with a portable sewing machine! They tie their heads up in gaily-colored bandannas—stuffing them so that they are like beehives, sometimes a foot high. Otherwise they dress like the first German missionaries, with tight basques, leg-o'-mutton sleeves, long, full and numerous skirts, always an apron and a string of colorful beads.

They love primitive colors and patches. I remember one skirt made *à la* checkerboard of two-figured material with green and brick backgrounds respectively! Or we might meet a short, smiling Hottentot nurse-maid pushing a baby carriage and gossiping with an errand boy.

Only business people have telephones; so rather than trudge to the other end of the town through the heat and glare and sand to invite your friend to morning tea, you send your house-boy with a note. One meets innumerable house-boys sauntering along importantly flashing envelopes.

Every household has at least one servant. No white man does manual labor. Every white man is a master, and it is a true saying that heads as well as feet swell in South West Africa.

I was told that Mount Brukkaros was at least ten degrees cooler than town, and there was always a breeze. So, with the thermometer reaching 100, perhaps 104 in Keetmanshoop, we were glad of a change.

THE START FOR THE MOUNTAIN

We started for the mountain just after lunch, when the whole town usually sleeps. Even the stores and offices close between one and three. But there were 62 miles of desert road to drive and a mountain to climb before dark. We had a load of supplies—meat, butter, carrots, and lettuce—all wrapped in damp gunny sacks to keep cool. In addition, there were Mr. Motz, who is a trader on the reserve and our nearest neighbor; several cases of gasoline; a water bag; and a native boy in the back of the screen truck. Betty was in front, on my lap, Mr. Hoover at the wheel.

The first seven or eight miles were indeed discouraging. The flatness, the dryness, the barrenness, the cruelty of that seemingly endless desert plain struck me full force. My heart sank at the idea of three years in this.

We came to a gate. Now we were on Merenski's farm. Farm? Those dried-up clumps of grass, those poor cows and goats? A line of green trees and two windmills came into view over at the right. Then some stone buildings and patches of green, which we decided must be alfalfa beds or grapevines. Then, over on the left, a strange group of conical-shaped mountains appeared like a group

Photograph by William H. Hoover

WHERE WATER WAS TO BE HAD FOR THE DIGGING

On the rare occasions when rain fell, the water collecting in the crater flowed over this 200-foot precipice into the water hole, the chief source of water supply for the "shepherds of the sun." Usually the sandy bottom was dry and the water boy had to dig and bail. Mr. Greeley stands on top of the precipice.

Photograph by William H. Hoover

BRINGING UP WATER, A DAILY CHORE

Water was the expedition's biggest problem. Not enough rain could be caught from the roofs to supply the family. Donkeys brought two 10-gallon cans of water every day, up the mile-long, blistering trail, from the water hole.

of pyramids, and it was association that made one particularly big hill near them look as if a sculptor had gathered up all the sand around, shaped the sphinx and then never finished it.

We came to the other border line of Merenski's farm and were nearer our fantastically shaped hills when suddenly the Brukkaros was in sight, a beautiful, hazy blue, far away against the sky. All the country in between lay opened out before us in the gorgeous coloring of the desert. We could see tall smokelike columns reeling and zigzagging across the veldt. They were whirlwinds. One went across our path, blinding and choking us, so that we had to stop.

SHOVELING A WAY ACROSS A RIVER OF SAND

We approached another band of green, the Camel River bed, a small sandy stretch. The bushes and trees lining it were the only things that even suggested water. The river has water on the surface only after the rains, Mr. Motz explained.

There were miles of very bad bumps and jolts over heat-scorched country, that seemed the oldest land we had ever seen. Once we saw rocks that looked like petrified tree trunks. Huge cracks that somehow suggested floods began to appear. One of these the road descended with a grade of 45 degrees to the Great Fish River. This was another broad stretch of sand (about 100 yards) bordered with dusty-looking bushes and a few camelthorn trees.

The car went across with difficulty, as the track had been spoiled by an ox wagon carrying coal to the oil drilling ahead of us. It was necessary to shovel our way in some places.

Once across we breathed a sigh of relief and then, looking into the car, we burst out laughing. The native boy sitting in the back was gray to the eyelashes with dust!

The road turned a bend as it wound up from the river again and the noise of the car startled three little red jackals which had been playing in the road for all the world like puppies! They quickly disappeared in the bushes.

The Brukkaros was in sight again. It had been playing a veritable hide-and-seek with us, but now it stood out bold and clear, a deep, purplish blue against the sky, and dominated the whole horizon.

Half an hour more and we were at the stone shack of the oil drillers. They had prepared a delicious tea for us. Mr. Heiberg, the prospector, graciously introduced us to his native Danish black cheese and some Dutch liqueur chocolates.

It was already 5:30, so we pushed on another eight miles to Berseba, the center of the Hottentot Reserve. It consists mostly of beehive-shaped grass huts, a Lutheran church larger than any of the six in Keetmanshoop, and a missionary's home that looks like a good-sized oasis.

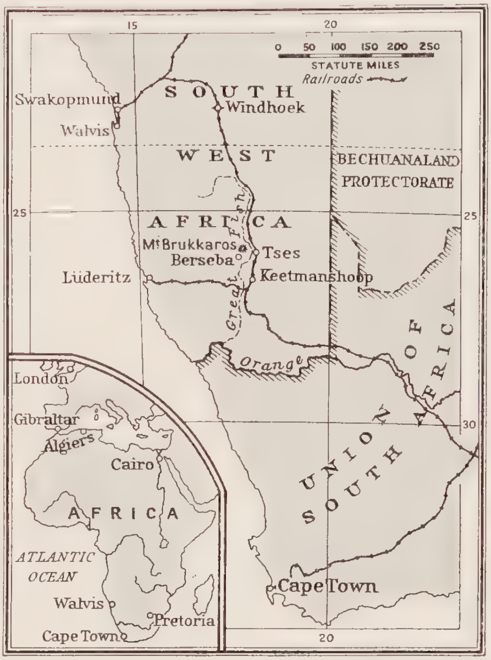
The missionaries were Mr. and Mrs. Eisenberg. All of their seven children, except one little boy, were at school in Germany.

They had a lovely garden and fig trees. The ground water in that particular spot is only three feet below the surface. It is really a part of the Great Fish River bed. Most of the time this river is chiefly sand on the surface, but we were told that when the rains come in summer we probably would not be able to get across for five or six weeks, but would have to depend on our natives for anything we really needed. It is wonderful the distance some of the native runners can go through the burning desert. Mr. Heiberg has an old man, over 70, who runs in twice a week for his mail, making the 50 miles each way in eight hours each.

THE APPROACH TO THE CRATER

A curious laughing group of Hottentots surrounded our car; their high cheek bones, pointed chins, and very low foreheads gave their faces a triangular appearance. Their beady black eyes missed no detail of our clothing, personality, and relationships, for their perception of human nature is keen.

Mr. Motz got off at his trading post and we drove on toward the mountain. Now it loomed dark blue, mysterious, majestic in front of us. The road skirted some red sand dunes, all patterned with waves by the wind, crossed two small dry river beds, and we were at the foot of the cup-shaped crater.



Drawn by C. E. Riddiford

MOUNT BRUKKAROS AND THE NEIGHBORING REGION

The work of the Mount Brukkaros Expedition, supported by the National Geographic Society, was to set up an observatory to make reports similar to those made by Smithsonian Institution solar observatories in Chile and at Table Mountain, California. The three observatories on three continents are reporting daily variations in the heat of the sun that reaches the earth. Every activity on the face of the earth is dependent on the sun's radiation, the variation of which is the subject of this study.

Up we climbed half a mile in low gear, on and up the side of a canyon that seemed to be the only opening in the crater cup. The garage was built on a little flat shelf which naturally invited one to rest and look out on the veldt. Colors in the canyon rival those of the Grand Canyon.

We unloaded the car, and after much talk about what suitcases we needed for the night and what would be spoiled if left at the garage till the next day, loaded the donkey.

Photograph by Fred A. Greeley

STROLLING THROUGH THE "ORCHARD"

Because the crater floor of Mount Brukkaros did support a few scattering aloes, it was christened the "orchard." The trees never bore fruit, but in the rainy season some of them burst into a skyrocket profusion of blossoms.

Mr. Greeley had come down to meet us. With his field glasses he had picked up our car 10 miles away, just as we left Berseba. He and Mr. Hoover took turns carrying Betty "pickaback."

After about 30 minutes' climbing along the side of the canyon toward the center of the crater, I looked far down on our right and saw a huge cliff like a dam across the gorge—a sheer drop of 200 feet. At the bottom of this, I was told, was our water hole, on about the same level as the garage.

The whole floor of the crater was veined with lines of green bush all leading into one sandy stretch at the top of this cliff, which means that when it does rain all the water from the inside of the mountain drains into the river bed and then makes a waterfall to our water hole far below in the canyon. Then to the left of us—pushing into the center of the cup as a radius does to its circle—was a ridge that formed still another canyon up which the trail turned. Just below the rim, on the south side, was the house (p. 493).

We arrived at 8 p. m., absolutely exhausted from heat, excitement, and exercise. Betty and I were given a light supper and tucked into bed.

Next morning we awoke late, both of us sore and stiff from the climb. The men were already at the observatory.

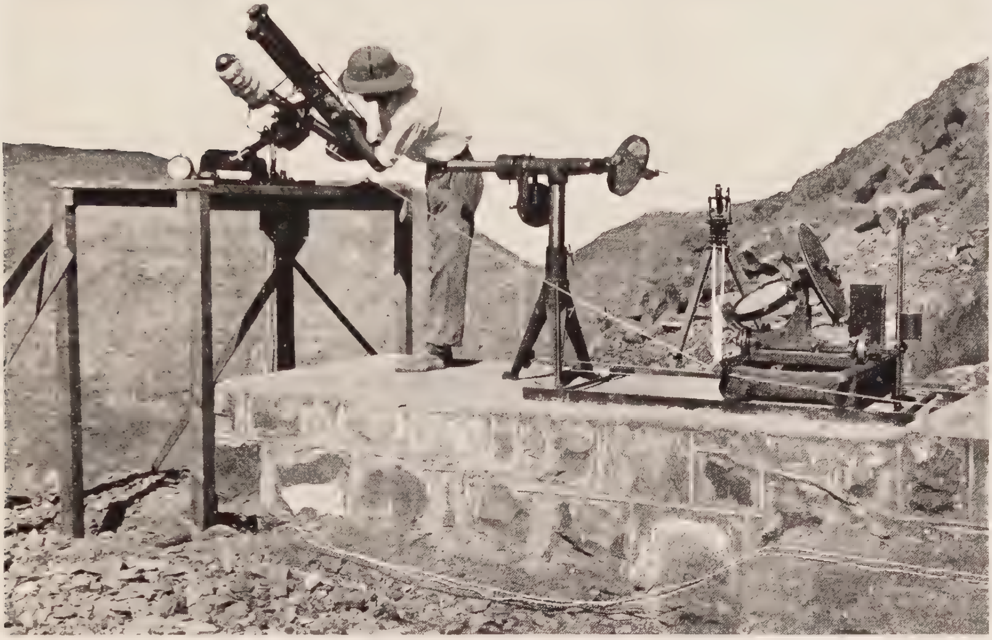
We bathed in the one-quart ration of water and then went out on the stoop to look around and breathe deep of the invigorating air.

Here we had the feeling of being in an altogether different climate from Keetmanshoop, although only 2,000 feet higher.

Looking down the canyon and straight across the crater to the ridge, there appeared a saddle in the hills. Oh, we weren't entirely shut in. Here was a little window to the rest of the world, through which we saw a stretch of sea-blue veldt.

THE IRON HOUSE—OUR HOME

Our little corrugated iron house certainly was a contrast to the big, high-ceilinged ones in town. All five rooms were lined with wood inside, and painted green



Photograph by William H. Hoover

TAKING A READING ON THE PYRHELIOMETER

Taking observations generally occupied the morning from soon after sunup until 9 or 12 o'clock. The rest of the day was spent in computing the results obtained by three instruments—the pyrheliometer, the bolometer, and the pyranometer. Computations require six hours or more. The intricacy of the observations may be judged by the fact that, once the data from six film exposures of solar radiation intensity have been taken, the figures have to be corrected for depth of atmosphere, ozone, water vapor, dust in the air, absorption in the mirror reflection, absorption in the black strip used in the instruments, and absorption in the prisms.

with brown trim and white ceilings. We decided on brown linoleum for the floors.

The kitchen was only 6 feet by 12. Along one side the men had made shelves for the dishes, utensils, and supplies, and arranged along the opposite wall were the stove, work table, sink, and homemade drain-board. They had set up the sink with a trap and outlet, although we couldn't have running water.

The water was stored in two big 40-gallon cans just outside the kitchen door. We soon got used to stepping outside the door and dipping out what we needed.

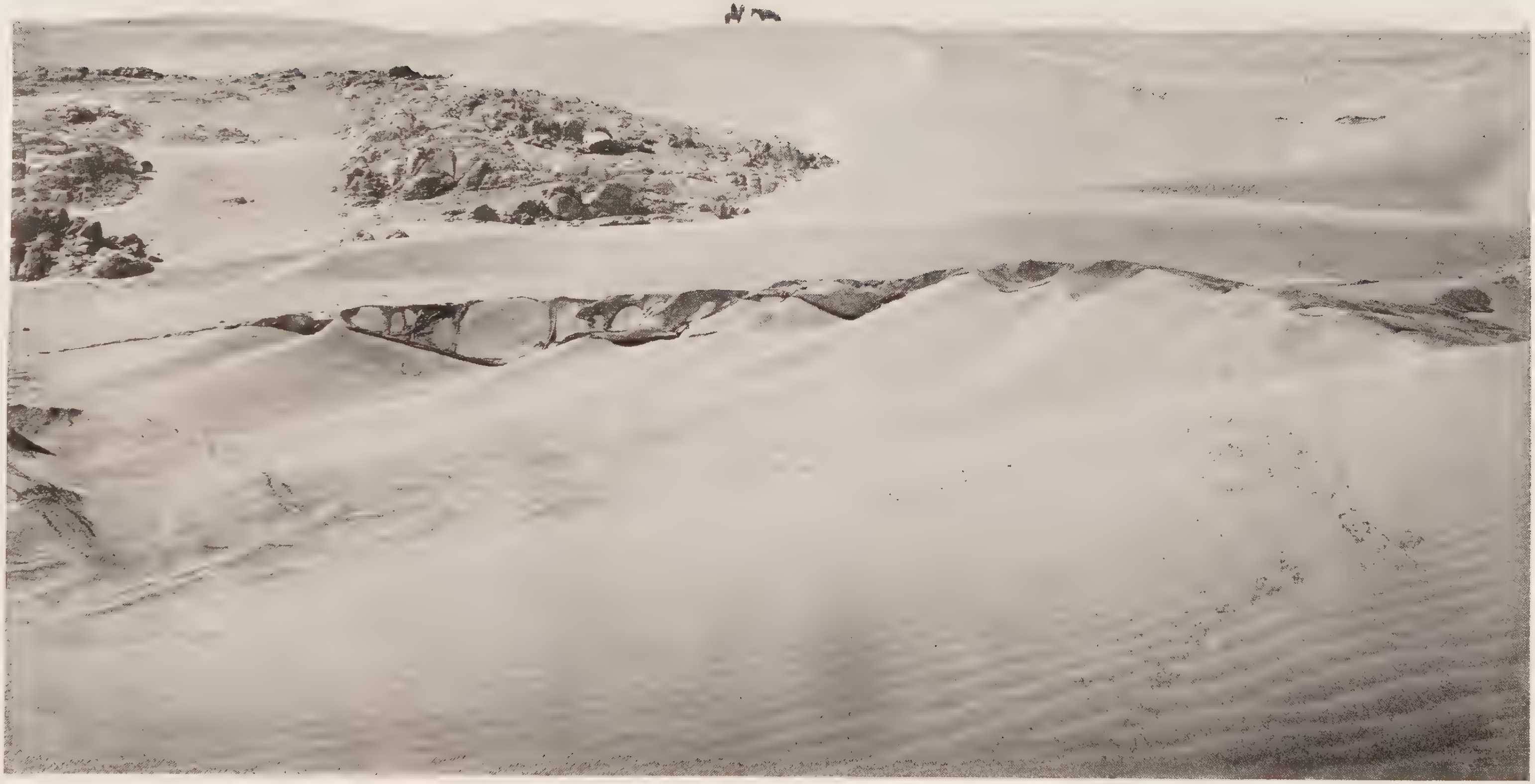
The gasoline stove was a joy. Wood and coal were out of the question; the donkeys had enough other things to bring up the trail. There was no worry about explosions because the tank was outside, and a gay red fire extinguisher occupied the wall space above the drain-board.

The front stoop was all the storeroom we had at first. It held food supplies, tools, camp beds, baby carriage (for Betty to sleep outdoors), and deck chairs.

That first morning Betty got into all kinds of things around the house, from a dynamite cap, left over from the blasting, to the potatoes, which I found her throwing off the porch so that they rolled down the mountain one by one while she shouted, "Ball, ball, ball!"

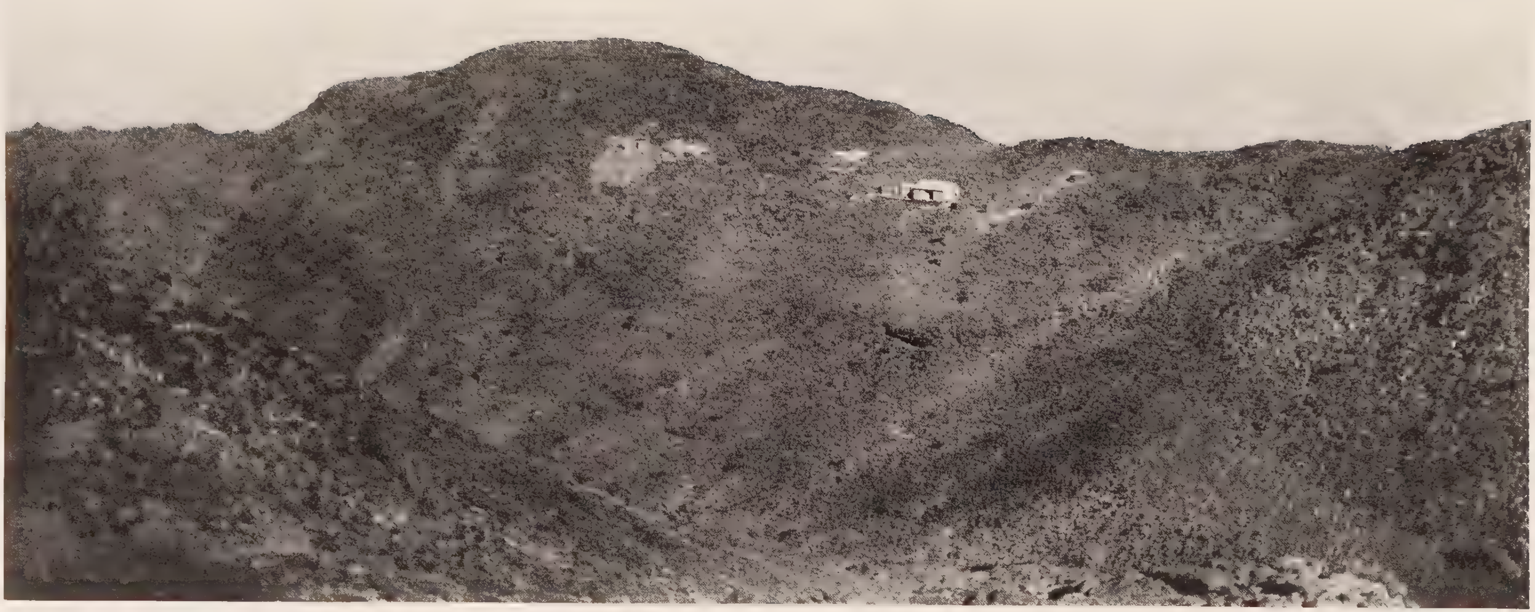
The little shiny white sink for washing dishes, and drain-board, and my enamel stove were quite modern in comparison with the kitchens in town, which were at least 30 years behind the times, probably because native labor is so cheap and no one does her own housework. I did all mine the first few months, but, with the increasingly hot weather, it did seem foolish when one could hire a boy for $5 a month.

Our laundry had to be sent to Berseba, to a native girl, Petrina, whom Mrs. Eisenberg recommended. She was spotless, and



SAND DUNES ON THE MARCH IN SOUTH WEST AFRICA

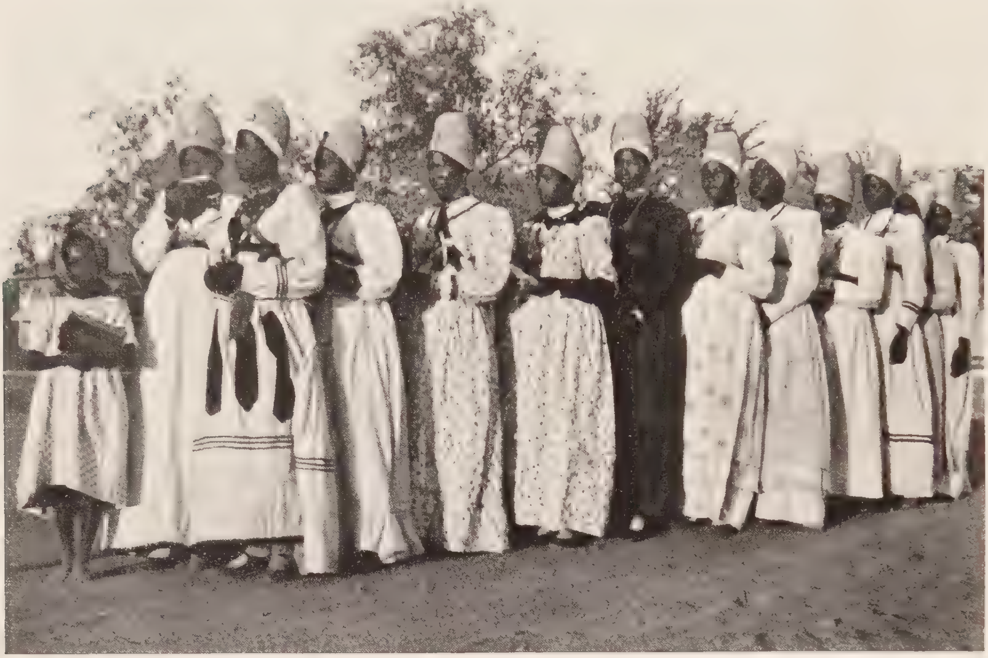
One year the rainfall was only 3 inches in the vicinity of Mount Brukkaros. The area between the highlands and the Atlantic Ocean is still more arid. The natives in the vicinity of Brukkaros had an extraordinary conception of the purposes of the expedition. On one occasion they confided to an official that the strangers "have been here three months and haven't made it rain yet." They had evidently decided that weather observations and sun observations meant making rain for them. The rainy season had been "on" quite a while, but without rain, so one girl asked the official if the Americans had closed up the sky.



Photograph by William H. Hoover

THE OBSERVATORY (LEFT) AND THE EXPEDITION HOUSE ON MOUNT BRUKKAROS

From the house a rock trail leads 700 feet to the observatory. From the rim a mountain range 120 miles away can be seen on a clear day. The trail to the water hole zigzags down to the right.



Photograph by Mrs. Erasmus

WESTERN FASHION DOES NOT EXTEND TO THE HERERO WOMEN

German missionaries 30 years ago introduced a contemporary style of dress among the Hereros, who have held to it unwaveringly ever since. Their headdresses are useful as well as ornamental, each Herero woman carrying her valuables, trinkets, and miscellaneous gimcracks in her hat.

so was her hut. She had washed household linen and men's clothes during the World War, when there were troops at Berseba, but I had to explain in my best German what plaits were, and how to use soap flakes. Tuberculosis is very prevalent in Berseba, but we decided that the hanging in the strong sunshine, the dry air, and the heat of the big charcoal irons were sterilizing factors.

EVAPORATION TAKES THE PLACE OF ICE

In town people cooled things by evaporation instead of ice. They had chests with double walls of wire screening on wooden frames, the space filled with charcoal, clinkers, or some other porous material, so that when water was poured over it the evaporation would cool the area inside. Of course, the hotter the day the more water was needed. There were tales of Christmas being 118° in the shade!

With our meager water supply we could have nothing of that kind. Our drinking water we boiled and cooled in canvas bags. But for a food container we had only a little screen cupboard in the shade on the stoop. All our meat had to be cooked the day it arrived; all our milk boiled as soon as it lost its animal heat. The butter I wrapped in a wet towel, and I discovered that lettuce, crisp and damp from washing, will keep well for four or five days in an air-tight tin in a shady spot.

We had to use lots of tinned things, and cook or eat anything which wouldn't keep as soon as it arrived. Dried beans and peas, onions, squash, cabbages, and pumpkins were frequently on our menu that first summer.

AN ELECTRIC REFRIGERATOR BRINGS JOY

I induced the merchants in town to give us things like bananas, pineapples, and tomatoes in various stages of ripening. Mrs. Eisenberg, the missionary, often surprised us with melons or vegetables from her garden. A flock of hens in a coop gave us eggs.

It was a problem getting enough vitamins for my family. Imagine how glad I was when our request for an electric refrigerator to be sent from home, was granted. Naturally we couldn't get a whole machine up the mountain, so we ordered the freezing unit. The menfolk built the chest, installed the unit, set up a gasoline motor, and made all the necessary connections.

Inside the box looked very professional. It had 5 cubic feet of space, and was lined with heavily galvanized iron. The racks were made of heavy screening. The insulation was an 8-inch wall of sawdust. When completed it was too big for the kitchen, so we had to put it on the stoop.

Such a celebration when it was all finished and began to run! Every recipe in the book issued at that time called for whipped cream, marshmallows, or something else equally unobtainable on the mountain. So I had lots of fun experimenting with evaporated milk, using gelatin and flour as thickening agents. Pineapples were very cheap and made our favorite fruit ice. How Betty loved it!

My real triumph was guava ice. The rich pulp of guavas freezes with a lovely, smooth texture, and their flavor develops in the process.

INVENTING GAMES FOR BETTY

The days were busy ones. I had to be Betty's playmate. We took a walk every morning after breakfast up to the top of the ridge back of the house. The native cleared the rocks off a little flat place about 30 by 40 feet—a space to romp around and dance around, or skip rope and touch our toes.

Betty soon became expert at scrambling over the stony trails and throwing rocks at a target. We had to make a game of such prosaic things as bed-making and sweeping. She loved to sit on the kitchen table and "help me get lunch." By the time we left she was a real help at making mayonnaise, sifting flour, and beating eggs.

Our only servant at first was Puydos, a big, tall, black Herero boy, who drove the donkeys up with water and supplies. He lived down near the garage, in a little shelter made of packing cases. One Monday he didn't appear with water. We took the field glasses, went up to the "top," and looked down at the garage. Not a sign of life! Evidently he had not come back from his Sunday holiday in Berseba.

Tuesday afternoon he appeared. He said he hadn't been able to find the donkeys. In our relief at getting water—our supply was low—we probably weren't very severe.

Thursday he didn't appear.

Friday we decided there would be no more baths in the family.

Saturday, no more dishwashing.

Sunday our basin of water washed the faces of the whole family, and we had exactly three gallons left to be used as drinking water. Every dish, pot, and pan in the house was dirty. We were all feeling sticky, worried, and bad-tempered. Nothing to do but for the men to go down, find those donkeys, take them to the water hole, and drive them up.

We kept hoping and watching for Puydos, but by noon Mr. Hoover and Mr. Greeley had to start. It was hot, too. When they got down to the crater they spotted the donkeys, with the help of the field glasses, far away, calmly munching clumps of dried grass.

It was 7 o'clock by the time they had rounded up the donkeys, driven them down the steep trail to the water hole, up the trail again, and then made the long pull up to the house. They arrived very hot and weary, nursing a strong "native prejudice."

Puydos had his pay "docked" for several days and his ration of tobacco cut. His ration of corn meal, whole-wheat flour, sugar, tea, and soap we didn't cut, for he would have "found himself sick."

The next week he appeared at the house about 9 one evening and reported that the garage had burned down! He had pushed out the truck and torn the telephone off the wall, but the garage itself was "a heap of iron and burned wood."

THE JACOBUS HOTTENTOTS JOIN THE HOUSEHOLD

He was fired. He had directly disobeyed our instructions and had been sleeping inside the garage in the car. He must also have gone to sleep before the fire, for his evening meal was out.

Only two days before we had acquired a house-boy—a very thin, cross-eyed Hot-

Photograph by Fred A. Greeley

BRINGING THE BIRDS TO BRUKKAROS

Water, rather than food, enabled the dwellers at Observatory House to make friends with the birds. Blackbirds, sparrows, doves, and other species crowded the basin mounted on a post and drank as much as a gallon of water a day.

tentot who had arrived with a note written in good German.

A certain Jacobus Isaac explained that he was sending the bearer, Jacobus Nathan, to be my house-boy. In a few days, he promised, he would send his other son, Jacobus Cornelius, as soon as the latter returned from a certain farm where he had been herding sheep. Cornelius would be a good donkey boy!

It was very hot; Nathan had been trained by one good German housewife, so we were glad to let someone else polish our floors and do the dishes. Nathan went around singing German hymns in a high falsetto. "Silent Night" was his favorite. I finally gave up urging him to keep his person clean. He used too much water in his vain attempts. I made large aprons which he had to hang in the kitchen when he finished his work, and taught him to use lots of soap, with very hot water for the dishes, and trusted that his hands were sterilized along with the cups and saucers.

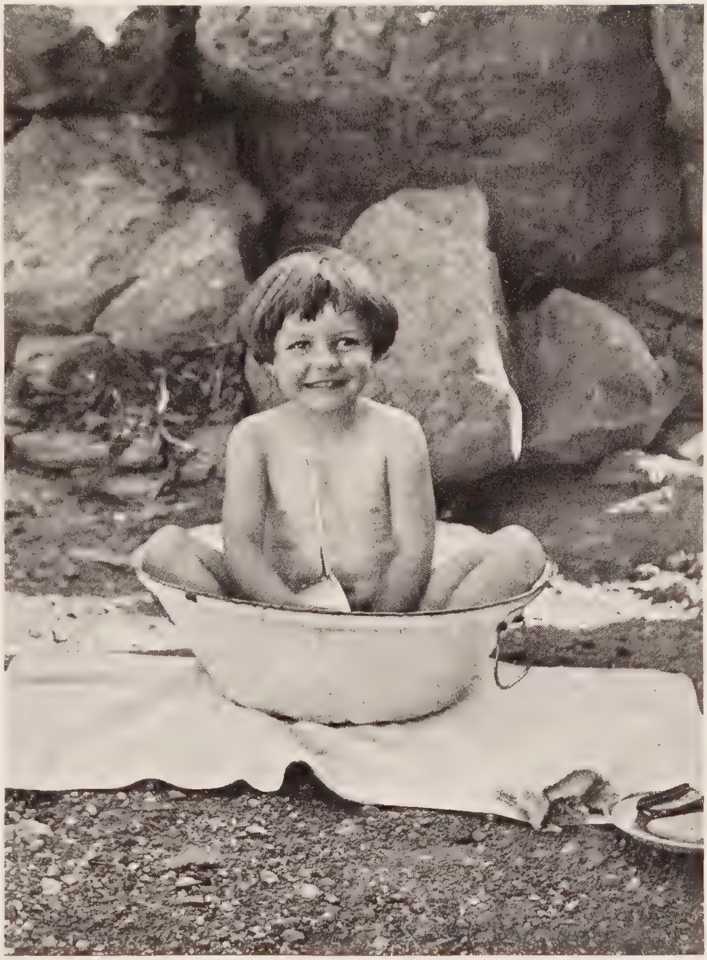
A MURDER TRIAL IN KEETMANSHOOP

One April day, Mr. Greeley drove Betty and me and the missionary's wife and little boy to Keetmanshoop. There was about a foot of water in the Great Fish River, and in some places it was rather swift. Mrs. Missionary remarked that it looked to her as if it were rising, so Mr. Greeley got up bright and early next day to come back to the mountain, but it had risen. It was up to his hips; so, of course, he couldn't get across. During the next ten days he made three unsuccessful attempts.

One car did get through, because the new storekeeper of Berseba and his wife had to get to Keetmanshoop to be witnesses in a High Court murder trial. They had to take off the magneto, carburetor, generator, and heaven knows what else, and then be pulled through by 12 oxen. As they sat in their car the water came up to their knees!

The murder had occurred just a week before our arrival. A native, a Bushman, had murdered his "missus" in her bed. They discovered at the trial that his motive was robbery. The woman's husband worked on the railroad, so she was alone. The whole of Keetmanshoop was stirred up about it. Neither Hottentots nor Hereros commit such crimes, but Bushmen, much farther to the north, are more savage. And they, the victim and her husband, had brought this boy with them when they moved here because he was such a good, faithful servant. It was a blood-curdling affair to hear about just as we arrived. The first night I was alone in the hotel I had quite a lot of money. I put it in my shoe on the window sill. Any old native could have it, but he needn't disturb Betty or me.

High Court is an event in Keetmanshoop. It is like one of our higher courts, except that it moves where it is needed. The judge is the biggest man in the country. He lives in his railway coach while in town and is only entertained publicly. The Railroad Institute got up a formal dance for him and his attachés. In the courtroom the judge wears a wig and gown, and it is a most impressive business, particularly when he pronounces a sentence of death in three languages, as in the case of the Bushman.



Photograph by William H. Hoover

BETTY LEARNS TO TAKE A BATH IN A QUART OF WATER

On one occasion, after her father had shingled her hair, Betty's mother that night rubbed olive oil in it, to combat dandruff. The ants smelled the oil and the next morning she woke up with a nest of them in her hair.

DUTCH FARMERS ON HOLIDAY

On another occasion the Governor-General stopped off on his way north for a shooting trip for big game, and did us the honor of opening the new railway station at Keetmanshoop, the old one having burned. All the farmers for miles and miles came in for the event, and Mr. Greeley had a good time studying the Dutch farmer on holiday. The Governor's speech had to be translated three times. He spoke in English, of course; then it was translated into German; then into the old form of Dutch which one group is trying to make the national language of the Union of South Africa; then into Namaqua for the Hottentots.

The Hottentots of Berseba, some 40 of them, rode in on their horses and were a sight worth seeing. The police, however, forbade them riding through the town.

Photograph by Fred A. Greeley

NATHAN, OUR HOUSE-BOY, WELCOMED TO THE BOSOM OF HIS FAMILY AT BERSEBA

A Hottentot's trousers of many patches are like the sailor's knife which lasted him a lifetime, although it had had three new handles and six new blades. Nathan's Hottentot home consists of a framework of branches supporting a roof of matting woven with reeds cut near the Great Fish River.

The natives here are very strictly controlled. The only ones in South Africa allowed to have firearms are the Berseba Hottentots, because they have never made war on the whites.

There was a parade of the police and all the autos of the district, about 70. Cars cost about two and a half times what they do at home, and gasoline is 80 cents a British gallon (nearly five quarts); so not many people can afford them.

Either Mr. Hoover or Mr. Greeley went to town every two weeks to bring out food, supplies, and mail.

ALONE IN THE DESERT

Once when I was learning to drive we were on our way to a farm 70 miles from town. There was no native with us. I broke an axle in the sand. We had the spare axle, but our jack broke, and we needed a wheel-puller. The wheels would not come off. So Mr. Hoover finally walked eight miles through sand to a telephone.

Through a misunderstanding about directions, the wrecking car did not find me for eight hours. Mr. Hoover waited for it in the settlement, where he had gone to telephone.

It was too hot to explore, so I just sat in the car and waited. I ate the lunch. A cloud of dust in the distance cheered me up. Now I would get a lift to the settlement! But the car went whizzing by on a road about 600 yards to my left. Neither my shouts nor horn were heard.

After hours of waiting I climbed to the top of a little hill to see if I could find a house within walking distance. The only person I had seen all afternoon was a native boy driving a herd of goats.

I could see one windmill from my lookout, but it was at least five miles away, and I couldn't be sure there was a house. It was most likely just a watering place for sheep. Suddenly from an opening between two hills opposite me came a little car along what I hadn't even recognized as a road. I shouted and waved. The thing drove up.

It was an ancient Ford roadster, just the chassis with a few boards for a body. It managed to carry the Boer, his guns, some tins, the usual gasoline and water reserve that everyone carried—and a blanket. The Boer spoke neither English nor German, but I managed to extract the cheering information that he was not going to the settlement; nor was our car on the road to it, and that it was about 5:30 o'clock.

I watched the sun go down, then went back to the car. It grew dark, and I was mighty thankful for the blankets, wondering if I could shoot the big, heavy rifle we'd brought in case we saw springbok.

At about 8:30 I heard a car in the distance. I turned on the lights and prayed hard that whoever it was would see me.

Up drove the wrecking car with Mr. Hoover, who had been picked up at the settlement. Because he had told them we were off the main road they had come all the way on an ox-wagon road, and so had missed me. I resolved never to travel again without a novel to read, a revolver, and a native boy to do the walking.

A SUNDAY PICNIC AND A NOTABLE SWIM

During the rainy season these sandy river beds often became rushing torrents. One cloudy Sunday, when the men did not have to take observations, we got an early start on a picnic to another crossing in the Great Fish River. It had rained the Thursday before, a third of an inch, all in one afternoon. I had never before seen it rain so hard. At about 3 it turned to hail. A big piece bounced in the window, across the room, and on the bed where Betty and I were having our usual siesta.

We found about four feet of water and a strong current racing over a roadway that was absolutely dry and sandy two or three months before. We cooked our lunch on rocks made hot with a little fire—eggs scrambled with tomato juice instead of milk, on big slabs of fresh brown bread. Then, after a nap, we had a wonderful swim—Betty, too. How she loved it! It was our first swim in more than a year. What matter if the water was muddy and lots of dead fish, two or three feet long, came floating down? We heard later that someone had been dynamiting in the water above us—a cruel way to fish. The fish seemed to belong to the catfish family. They live in the few open lagoons that one finds in the river beds throughout the year.

On our way home a lone springbok ran out from the bushes and across the road in front of the car, about 200 yards ahead of us.

They are beautiful creatures, these springbok—so graceful, a soft tan in color, with a streak of dark brown along each side, and a white flange down the end of their backs. And the way they run! Their hind feet land ahead of the spots their front feet have just left. They jump straight, stiff-legged up into the air, five or six feet, when they want to see the source of some unfamiliar scent coming across flat country. They are supposed to have roved the country in herds of thousands formerly. We often got into herds of one or two hundred on our trips to town. Ostriches like the same kind of stony, flat plains that springbok frequent.

On another occasion we took our supper over to another peak of our mountain to watch the sun set. We could see three separate and distinct thunderstorms, to the west, south, and southwest, but they never reached us. It was a gorgeous sight, and we enjoyed it especially because it was all south of our river crossing and would not make our next crossing difficult.

One day we had been seeing the most amazing mirages—beautiful lakes with trees along their mossy green banks, and even reflections in the water! Away in the distance appeared a strange-looking grove of small trees. They seemed to have no trunks! Nearer they looked like giant mushrooms with black tops and yellow stems. Then they moved! Their yellow necks began to show against the very blue sky, and by their swift, clumsy gait we recognized a drove of ostriches. They formed a straight line and walked solemnly forward in that formation parallel to the car.

Their eggs are the size of a small soup tureen and have very hard shells. With grinding implements of stone, the native women in the country north of us shape them into beads. The yolk and white are in about the same proportions as those of a hen's egg, but one of them is equal

Photograph by William H. Hoover

CELEBRATING CHRISTMAS WITH THE TEMPERATURE 100 IN THE SHADE

Betty's Christmas tree is at the end of the table. Friends from Keetmanshoop climbed the mountain to join in the holiday festivities (see text, opposite page).

to 24 Plymouth Rock's eggs—a breakfast for a giant. I made an omelet and scrambled eggs, then a cake, out of our first one, and still had egg left in the refrigerator.

The venison of springbok is very good eating. The meat is lean and would be dry and tough if roasted as beef is usually roasted. But the South Africans soak it in vinegar or sour milk for three or four days, then lard it with strips of bacon. One of my pet souvenirs is the long, thin larding needle, which I mean to try out on the cheaper cuts of beef.

Springbok meat is also delicious when cut in strips, salted, and dried in the same way an old prospector friend of ours in Arizona made "jerked meat."

NATHAN, THE HOTTENTOT, GETS WEARY AND DEPARTS

Hottentots are very lazy. Before the advent of the white man they spent their days wandering over the country with herds of wild cattle, so they had to follow the rains to find grass for the animals. They lived on milk and meat and desert roots and grasses. Now they live either on reserves, or farms, or work for the whites in town.

When the cold weather came along our Nathan loved sitting, sitting in the sun doing nothing; or, if it was windy, he'd stretch out his tasks so that they kept him in the house all day. It seemed to me the longer he stayed with us the less he tried to do. Finally the climax came one day when he refused point-blank to polish my shoes. I told him he could go to Berseba and stay there.

He went out to the shop where Mr. Hoover was working and said, "Boss, missis no good; Nathan go to Berseba, not come back." When Mr. Hoover told me about it I was furious that he hadn't given him a good shaking before he sent him off. I'd not let any native say "Boss no good." But Mr. Hoover explained his tone hadn't been disrespectful; it was merely his funny English. I wonder!

Our next boy was a "pickanin." I decided to get one young and teach him my ways. His intelligence amazed us until we found out he had had a white ancestor. He learned to light the gasoline stove properly and to use the steam-pressure cooker.

I was especially pleased because after Christmas he would be able to keep house for Mr. Hoover and Mr. Greeley when Betty and I were going to Cape Town for two months to get out of the heat. Irma and Sadie Herzberg, my congenial friends in town, were going, too. In fact, most of the men in town were left grass-widowers during the awful heat.

A HOUSE PARTY FOR CHRISTMAS

We decided to have a house party over Christmas. It would be too hot in town to enjoy the day. So Irma, Sadie, and their father, and Tom and Geoffrey Curtis, whose family had already gone to the coast, were invited.

Mr. Greeley went to town on Thursday to bring out the mail, the turkey, and do the last-minute shopping. We learned by telephone that the river was in flood. There had been lots of rain in the north between Windhoek and Rehoboth—250 to 300 miles north of us. The flood was expected to reach Gibeon some time Thursday night or Friday morning. It always takes two days for the flood waters of the river to get from Gibeon to the Berseba crossing, so Mr. Greeley would certainly get through all right Friday.

But Tom and Geoffrey were to bring Irma and Sadie out in the doctor's car on Saturday afternoon. The doctor had gone to Cape Town for a month and given Tom the use of the car. Tom and Geoffrey had to work until 1 o'clock, so they didn't start until 2, but drove fast and furious. The river bed was still sand when they crossed.

They arrived about 7 o'clock, having driven through a big rain this side of Berseba and a dust storm after that.

There were nine of us, counting Betty. We ate in the new building. It hadn't become the shop and office yet, because the partition wasn't in, so it was one long room of gray cement walls and floor, with a door at each end, two windows in front, and the gas engine over in the corner.

Mr. Greeley and Mr. Hoover made a long table out of some boards and two wooden horses, and on it was the Christmas tree, a tiny German one, with its balls and tinsel shining in the light from a candle on each end of the table (see illustration, page 500). The windows had gay, flowery curtains and between them were strung eight socks and a big stocking for Betty. A jolly Santa off the cover of a magazine hung above them.

At each end along the wall was a couch with our bright Bolivian rugs and cushions with black and white skin rugs along the side (Tom's and Geoffrey's beds by night).

Over the serving table were two Japanese lanterns. Sadie said it reminded her of an underground café, and Irma said it was more like her idea of a Wild West dance hall. Oh, and we put the radio on the cement engine stand, too. It was our Christmas present from the National Geographic Society and had arrived just in time.

Tom and Geoffrey said everything was there but the mistletoe. So Sadie and I cut a little piece out of a magazine cover and tacked it up in the doorway and waited for them to discover it. Irma and I played Santa Claus with the socks while Sadie mended the camp cot Mr. Greeley slept on.

AN AMERICAN CHRISTMAS MENU IN SOUTH AFRICA

At breakfast Betty had six new dolls and a carriage. We lined the dolls up. She looked and looked with such surprised and delighted "Ohs." "New dolly, new dolly! One, two, and three and four new dolly and, and oh!" She loved pulling the packages out of her stocking, and was most thrilled with a little rubber donkey. She confided to me later that it was going to the water hole for water with Cornelsit, her name for Cornelius.

The turkey weighed 17 pounds, and so took five hours to cook. But it was delicious. We all took turns basting it every 15 minutes. Our Christmas menu was more homelike than the temperature of the day: Clear tomato bouillon, turkey with stuffing and currant jelly, mashed potatoes, peas, cucumber salad, iced *sponspeck* (muskmelon), and Christmas fruit cake.

Then we put Betty to bed and went up to the top of the mountain for the fireworks. The rockets, pinwheels, and firecrackers echoed all through the old mountain. Our natives marveled, of course, and shouted every time one went off. Tom scared

Photograph by William H. Hoover

OFF FOR A PICNIC

Holidays in the crater or on some neighboring slope of the mountain were the chief diversion of the Brukkaros dwellers. A concrete-surfaced tennis court had long been planned, but the rains were never heavy enough to supply a surplus of water necessary for mixing the cement. Mrs. Hoover frequently resorted to skipping rope for exercise. From left to right, the author, Mr. Greeley, Betty, and Miss Herzberg, a friend from Keetmanshoop.

them away by throwing a lighted cracker in their direction. "Madi!" "Madi!" they shouted as they scampered away. I've yet to find anyone who can translate "Madi," their favorite exclamation.

The day after Christmas was also a holiday, a "bank holiday." At breakfast time a telephone message came from Gibeon that the Great Fish River flood had reached there Sunday night, which meant that our party would have to come to an end Tuesday morning, so that they could all be safely across the river bed before Tuesday noon. They were.

The flood kept us marooned on the mountain until January 11, and even then it was impossible to get the car through. Betty and I had our reservations made to leave Keetmanshoop for Cape Town on the 17th. All the old-timers said we ought to get across the river as soon as we possibly could, before more rain came.

Arrangements were made by telephone for supplies and mail to be brought to the river. Then we waded across through the hip-deep, muddy stream. Mr. Hoover carried Betty on his shoulders, as he did when climbing the mountain.

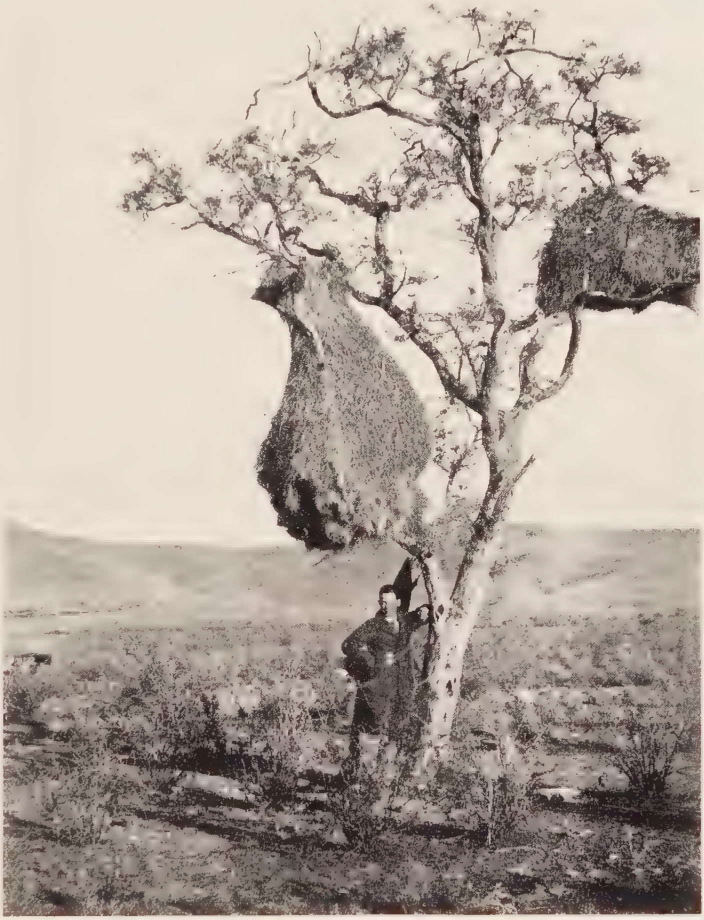
There was great excitement at the river. All Berseba came to see us cross, and the missionary took pictures. None of the natives or members of the mission had ever seen a modern bathing costume before, I'm sure, so their faces were a study when I emerged from behind the bushes. My native girl begged me not to go—she flatly refused—and said she didn't even want to watch us; she would "die of anxiety." It wasn't really dangerous.

Our house-boy came to town to look after Betty during the busy hours of last-minute sewing and packing. He was so enthralled with "city life" that the day after our train left he went back to the mountain and asked Mr. Hoover for his wages and left the two men to keep house for themselves. All my careful training wasted!

We went to one of the Cape Peninsula's big beaches. We couldn't get enough sea air. It was so wonderful after Keetmanshoop—so damp and salty and invigorating, and it was even more wonderful to be cool all the time.

Betty loved the water—the "big water," she called it. I learned to "surf." It gives one a glorious sensation, like sleigh-riding down the wave, through the water up onto the beach. We enjoyed people, stories, music, and the bath-tub so—and the fruit, the greenness, and rain!

Mr. Hoover wrote that he had acquired a new house-boy named Autumn Tea-pot! The name gave me hope that the boy had found that appellation in some English household and probably knew enough to take good care of our family.



Photograph by Austin West

SOCIETY BIRDS BUILD APARTMENTS IN TREES

The rare trees of this arid country are usurped by these communally inclined birds. As many as two hundred birds may occupy one penthouse.

THE MOUNTAIN TURNS GREEN

The mountain was all green upon our return after the rain. Grass grew in every crevice and cranny between the rocks. Every little rain the previous summer had brought some grass and even a few flowers. But both flowers and grass soon dried up. One kind of grass the natives call "eight-day grass." It grows very rapidly, but never fully develops unless it gets a second rain within eight days.

Flowers came up everywhere. We collected and pressed 50 varieties. Even the lone tree, the kukubaum, in front of the house, a naked, dead-looking cactus aloe, about 10 feet high, showed signs of life. A whole group of them down in the crater burst into bloom with waxy yellow flowers. We called them "the orchard."

April was a delightful month. The temperature was just right for climbing, so there were picnics galore.

One day we climbed all the way round the mountain on the ridge of the cup. It took us eight hours, with 45 minutes out for lunch. It was mighty hard walking—continuous scrambling over bowlders, climbing up and down the rough outline of the ridge. The views of the surrounding country were marvelous; from the high points we could see at least 80 miles in all directions. We could even see Lord Hill, a peak of the Karas Mountains, 120 miles away. I was convinced of the earth's roundness at last—I had always merely accepted what the geography books said. But that day on the mountain I felt it. We could follow the course of the Great Fish River, sometimes by the water shining in it and sometimes by a line of green along its banks.

A LEOPARD HUNT

One night Autumn Teapot forgot to shut the chicken coop. The next morning three hens were missing. During the night we had heard a leopard!

The growl had exactly the same rhythm as a donkey's bray, but the tone was deeper and actually hungry and fierce. In the night I had snuggled close to Mr. Hoover and consoled myself with the thought that they weren't man hunters. Leopards will not enter a house to go after a man. But if one meets a leopard on the trail suddenly or gets in its way, they are nasty things to have around! So the next night we set a trap in the chicken coop and left the door open.

In the morning the trap was gone although it had been wired down. The chickens were all there, but there were leopard tracks around the coop. Cornelius and Autumn were just as excited as we were.

Mr. Hoover ran in for our only gun, a 22-caliber target rifle. Mr. Greeley took a spade, Autumn a broom handle, and Cornelius an iron bar. Dingaan, our dog, was excited, too. Mr. Hoover was very impatient because the dog kept "messing up the spoor" and couldn't just stick to the scent and so lead them straight to the animal. But the dog had never been trained to do any hunting. Perhaps it had more of an idea of the danger than we.

The mountain is so rocky and a leopard so beautifully adapted to leap from one rock to another that it was a difficult trail. Betty and I watched the men disappear over the top of the ridge on the south side, Mr. Hoover in the lead. But it was two hours before we heard shots. Could they really be getting it?

Imagine our astonishment when, in about 15 minutes over the hill they came, the two natives carrying a big leopard! Seven feet long from the tip of its tail to the end of its nose, powerful and vicious looking; a female, tawny and lithe, so perfectly suited to its environment that we felt the least bit sad.

Mr. Hoover had seen a flash of yellow high up in a cave formed by some huge rocks. There seemed to be two openings. He shouted to the others, sat down and smoked his pipe while he waited for them to come up. Mr. Greeley took up a position at one opening, Mr. Hoover at the other. Mr. Hoover shot into the cave and the leopard made a dash at Mr. Greeley, who jumped downward and sideways about 14 feet!

Luckily, and it was only afterward that we realized how luckily, the leopard jumped straight down the cliff, knocking over the dog. Before it could get at Mr. Greeley, Mr. Hoover shot it in the back, somewhere in the spinal column, paralyzing it; reloaded and hit it in the eye with the second shot. Mr. Greeley hadn't stopped looking startled by the time he reached the house. They had expected something more like an Arizona wild cat!

Such excitement! Mr. Hoover posed as the mighty hunter; Mr. Greeley posed; they posed together; we posed the natives; then the whole family posed. Mr. Hoover gave Cornelius strict instructions not to skin the beast until after he had developed the films in the dark room at the observatory. He wasn't satisfied with the background, so we had to pose all over again.

The next day we took the skin down to Berseba to be cured. The old Hottentot captain wasn't a bit surprised. He told us that before the Public Works Department had started building on the mountain, a hunt had been organized and they had caught seven leopards! He would try to organize another.

Meanwhile Mr. Hoover went to town and purchased a big automatic revolver. We found it much more difficult to shoot than a rifle and spent many an afternoon shooting bottles, or at them.

POISON-SPITTING SERPENTS CHIEF MENACE

Our only other dangerous creatures were snakes. The men killed several black ringhals, cobras that spit poison. Once we found one coiled in Betty's doorway. We screened the house immediately.

Photograph by Mrs. William H. Hoover

THE CHICKEN THIEF THAT BECAME A FUR RUG

Mr. Hoover and Mr. Greeley went leopard hunting with a 22-caliber rifle and some clubs, Cornelius and Autumn Teapot bringing up the rear. They discovered the animal in a cave, one foot still in the trap it had carried off from the chicken house. A shot brought the leopard bounding out, but, hindered by the trap, the beast missed the ledge where Mr. Greeley stood. As it fell, Mr. Hoover aimed and "made the best shot he will ever make in his life," through the leopard's eye.

Another day Mr. Hoover went into a little temporary storeroom made of loosely piled rocks. He felt something damp on his cheek. He looked up. Coiled between the rocks and the corrugated iron roof was a big ringhals, its head flattened out and spitting. Mr. Hoover ran into the house, got his rifle, and soon polished it off. The snake was five feet long.

I hated the idea of snakes, but soon decided that they were more afraid of us than we were of them. Every snake killed had to be hunted. I often wondered what I would do if I should meet one. When the time came and I saw a big, black thing coiling around a corner of our storehouse I ran. I didn't stop to think; I just automatically ran as fast as I could to the house. We had shown Betty one of the "deaded" ones, and taught her she must run quick if she saw one. We always kept a supply of snake-bite serum on hand.

The natives have several superstitions about snakes. One day while I was cooking I spilled sugar on the fire. Autumn gave a cry of distress. "Oh! Missy! Missy! Must watch out to-day. One time old woman in Berseba spilled sugar on fire, big black snake came down through roof of her hut--bite her—she dead!"

Needless to say, I was glad when that day was over. I suppose the tale is built around sugar because the natives love it so. They will do anything for sugar, tea, or tobacco.

If you are driving along the road on a hot day and have a puncture, just sit and wait awhile. A native boy will most likely come along. He will be glad to do the pumping up for a handful of tobacco.

The Hottentot language is very interesting. It is full of clicks and is exceedingly difficult to learn. The seven basic clicks have variations, and often one word will have several clicks. *Geitsi! Gubib* (with the exclamation point representing the click) is the Hottentot equivalent of Brukkaros, brukkie meaning trousers and karos meaning fur rug or cover. From

Berseba the mountain's outline does look like a pair of primitive pantaloons open at the back, such as the natives used to wear.

Hottentot names always bring a vivid picture to mind. Mr. Hoover and Mr. Greeley were the "shepherds of the sun." We were the "mountain people" and our car "the mountain car." A stork is "a bird with a gray waistcoat." A certain water hole is called "the place where the leopard killed two men."

THE HOTTENTOT WIFE LIVES A CARE-FREE LIFE

One day both Cornelius and Autumn informed me they were to be married. In turn we gave them time off for the big event and $5 each for a wedding present. But no wives ever came to live in the little stone shack. "No," they said, "our women won't live on the Brukkaros. They say there is no one to talk to."

A Hottentot wife's household duties aren't very heavy. Every morning a good one shakes out the skins the family sleep on. If she is very careful she may beat them with a stick. She carries water from the well or river and gathers wood for the fire to cook the evening meal of porridge. The wood gathering probably takes up most of the time.

There was much laughter and endless chatter during the visits of the boys' kinfolk. They have a superstition about a big white snake who lives down in the center of the Brukkaros. We think we unearthed the origin of that when we woke up one cold morning in May and found the crater filled by a big, white cloud.

Winters are short on Brukkaros—the coldest months being May, June, and July. The temperature seldom goes below freezing; but once we had snow, just on the mountain, of course. It only lasted about 20 minutes, but how we enjoyed it! We wrapped up, went out and danced around. Betty had never seen any before. It was a real taste of home.

Our chief delight in winter was the radio. All summer it was very temperamental because of static, but with the coming of clear, cold weather we had good reception in the evenings from Cape Town, Johannesburg, and Durban. Besides the music we especially enjoyed "News of the Day" broadcast at 9 p. m. Our newspapers were always late and we wanted to hear things as they happened.

During these same months there were terrible winds. Gales blowing 40 and 50 miles an hour would continue three or even four days. At night we couldn't sleep for the noise and during the day we were prisoners in the house. Everything that wasn't well fastened down would move. Once the wicker chairs were blown off the stoop 200 yards down the hill.

One night a ripping big-gun sound wakened us. The roof had blown off the office and shop building!

ACCLIMATED AT LAST

On a beautiful, clear, crisp morning, a great calm after one of these gales, we awoke with a feeling that everything had relaxed during the night. The very spirit of peace and rest was in the air. We went out on the stoop for some deep breaths. On the ridge opposite the house were three beautiful cliff springers silhouetted against the sky. They are the swiftest and most graceful bucks of all, their eyes the softest and most beautiful of any animal I know.

I sat in the sun, the only warm place in winter, and watched them for an hour. Betty had gone up the "dervadory, to help Daddy and Fred." I dreamed of home and friends and the wonderful trip to America that we would have next summer. We would go up the east coast of Africa, through the Red Sea, to Cairo, across the Mediterranean to France, to Paris, to London—how I love its chimney pots and England's green—then our own New York and home at last!

The men coming down the path for lunch surprised me. I had dreamed away a whole morning sitting in the sun and doing nothing—just like any Hottentot.

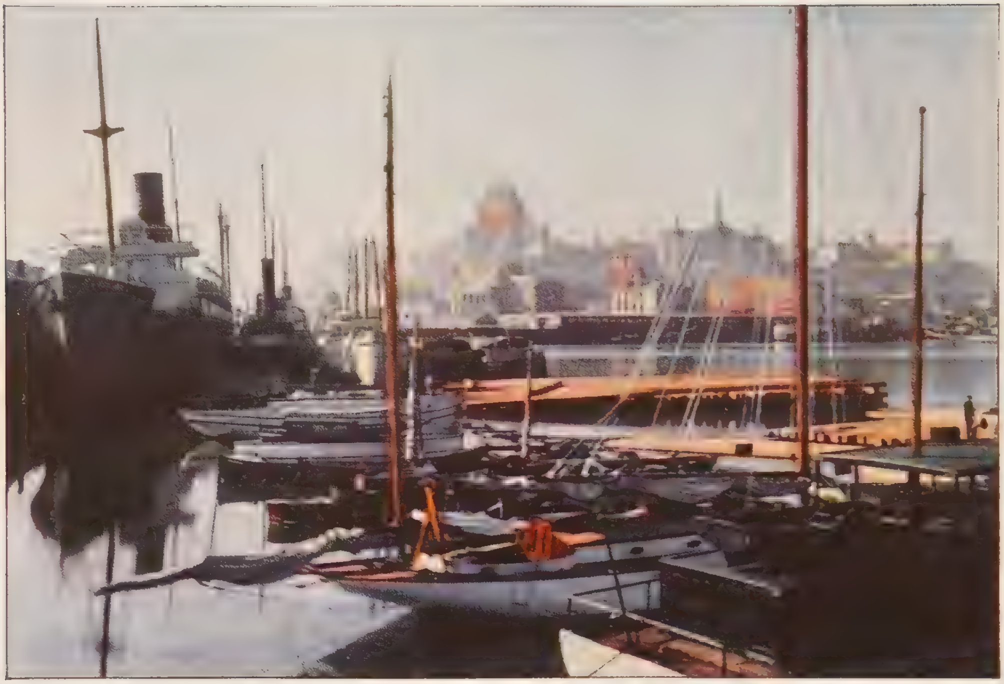
I had become acclimated!

An account of the scientific results of the Mount Brukkaros Expedition of the National Geographic Society in coöperation with the Smithsonian Institution will be published later in the NATIONAL GEOGRAPHIC MAGAZINE.

© National Geographic Society Natural-Color Photograph by William D. Boutwell

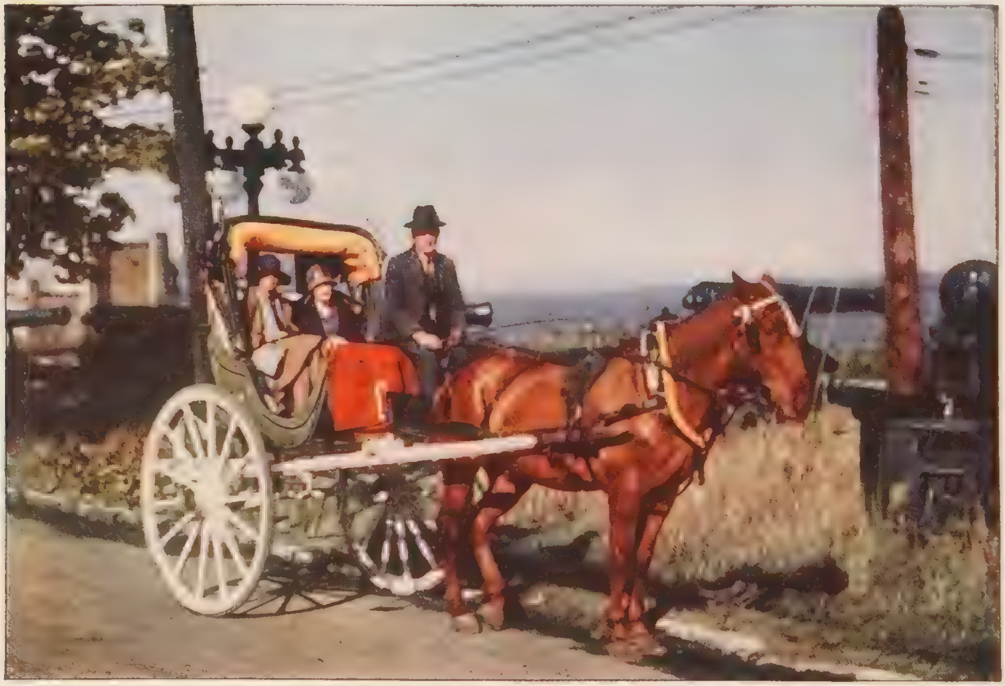
THE BLACK RIVERS OF QUEBEC RUN RICH IN "WHITE COAL"

Like liquid from a ladle, the torrent of Montmorency Falls, more than one hundred feet higher than Niagara Falls, spills over the edge of the Laurentian Shield plateau into the St. Lawrence River. Passengers on liners sailing up or down the river see the cascade, which bursts into view six miles below Quebec City. The province has water-power resources estimated at 13,000,000 horsepower.



THE SKYLINE OF QUEBEC

Voyagers landing at the quay see the towers of Quebec against the western sky. Far to the left is the grim Citadel fort (see also Color Plates IV and V), then courtly Château Frontenac, the graceful spire of Laval University and on the right L'Hôtel Dieu du Precieux Sang, a hospital founded by Duchess Aiguillon in 1657.



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Natural-Color Photographs by William D. Boutwell

RIDING ON THE RAMPARTS IN A "CALECHE"

The *calèche* of Quebec is a graceful relic of older days, popular with visitors from the United States. The shape of a calèche suggests that it is a lineal descendant of Cinderella's pumpkin coach.

© National Geographic Society Natural-Color Photograph by Jacob Gayer

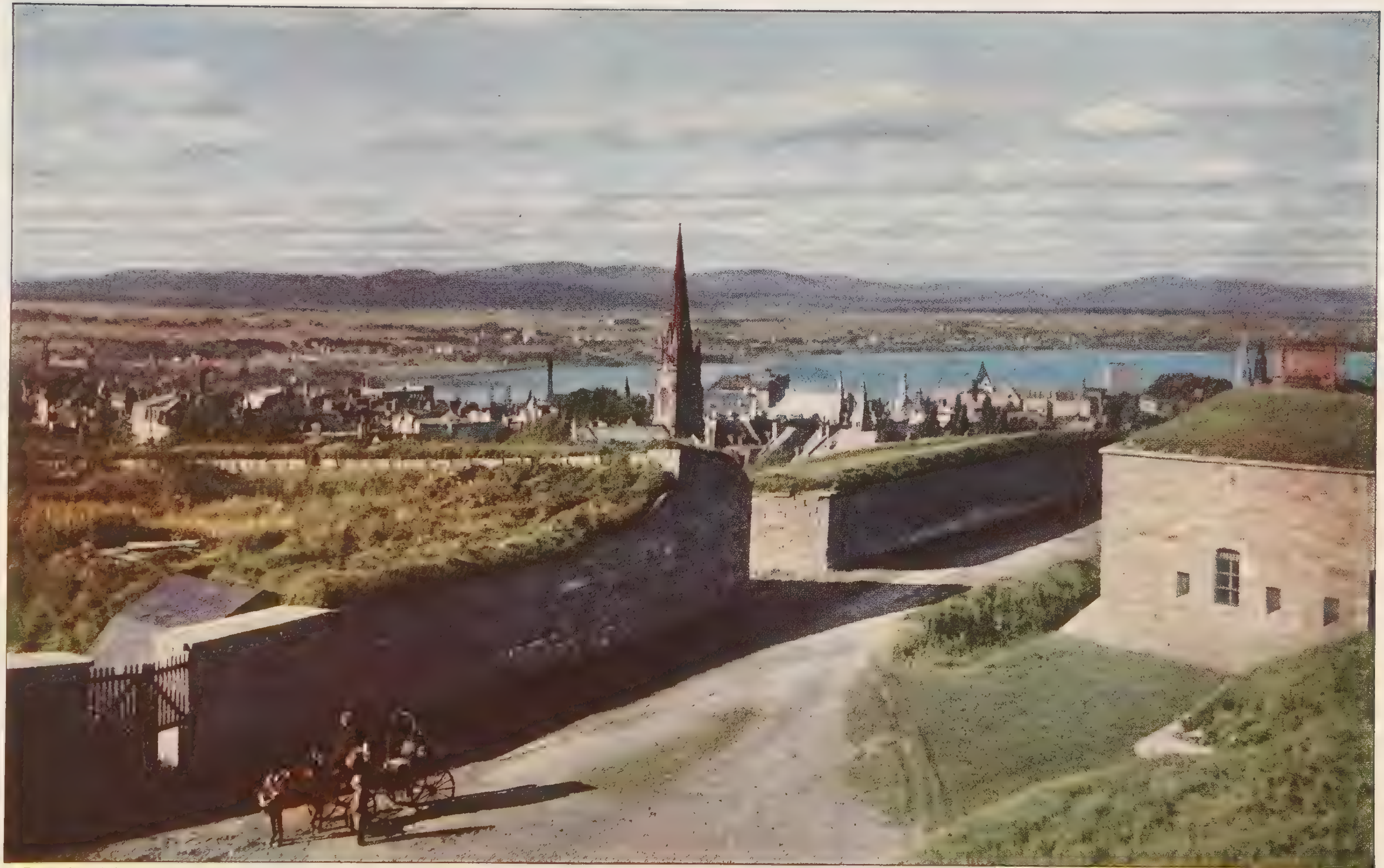
LEARNING THE THRILLS OF "MUSHING" WITH A TEAM OF HUSKIES

Tobogganing down the triple chutes of Citadel Hill, skiing, bob-sleighing, snowshoeing, skating, curling, and other winter sports are making Quebec a North American St. Moritz. At night carnivals the snowshoe clubs march, their members dressed in uniforms as varicolored as those of Christmas card carolers.

© National Geographic Society Natural-Color Photograph by William D. Boutwell

CONTENTMENT IS NOW THE GRIST OF VINCENNES MANOR MILL

The creaking, wooden wheels of Moulin Vincennes, that once ground the wheat of *habitants*, no longer turn. But the architect owner has left them in place as part of the furniture of his house perched above the St. Lawrence River.



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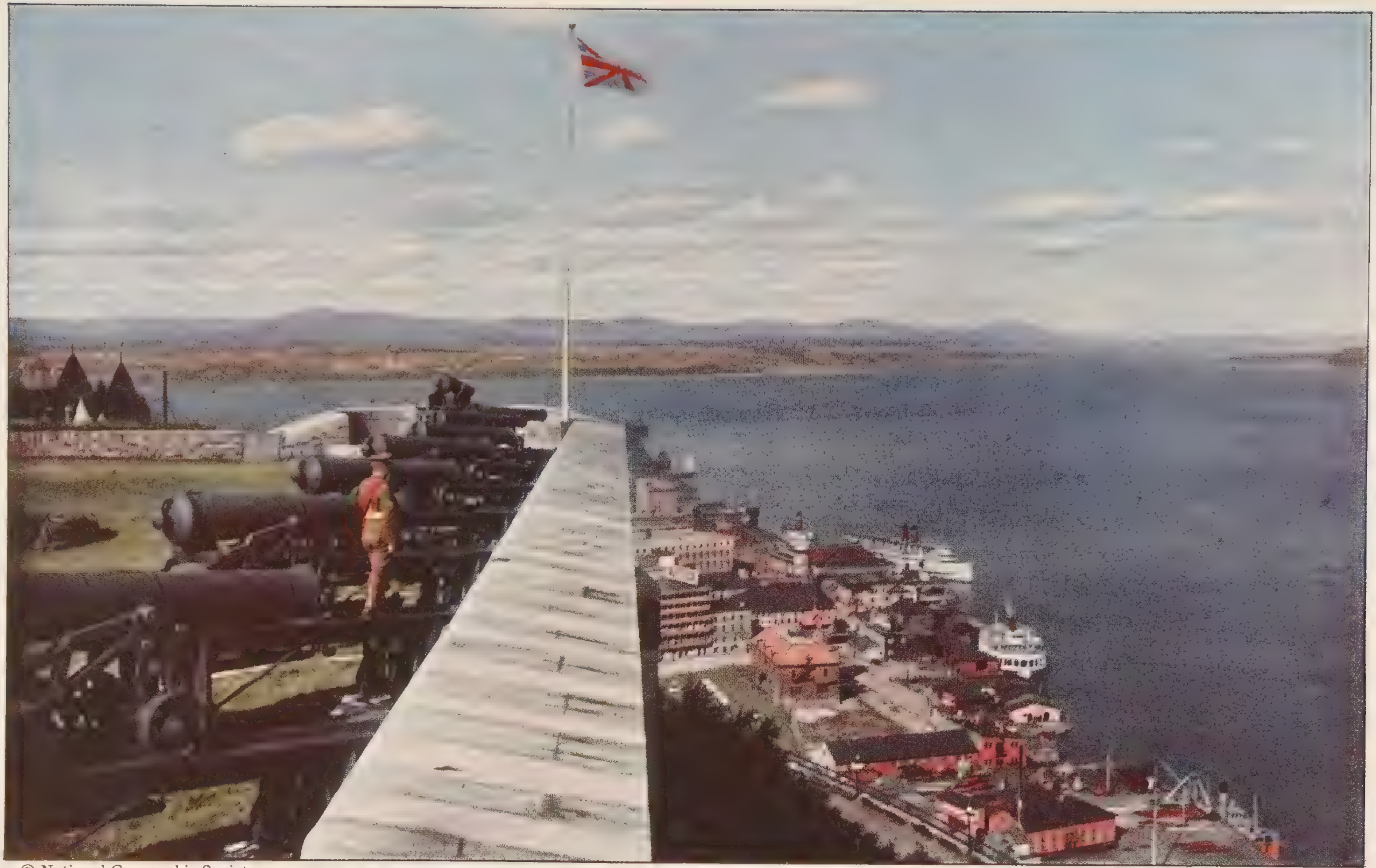
Natural-Color Photograph by William D. Boutwell

FRANCE HELD IT, BRITAIN SEIZED IT, A FRENCH-CANADIAN REGIMENT COMMANDS IT

The Duke of Wellington, victor of Waterloo, approved the plans which made the Citadel of Quebec at one time a Gibraltar of America. The inner fortifications—which are to-day obsolescent—overlook the moat, which in turn overlooks the outer ramparts inclosing Upper Town Quebec.



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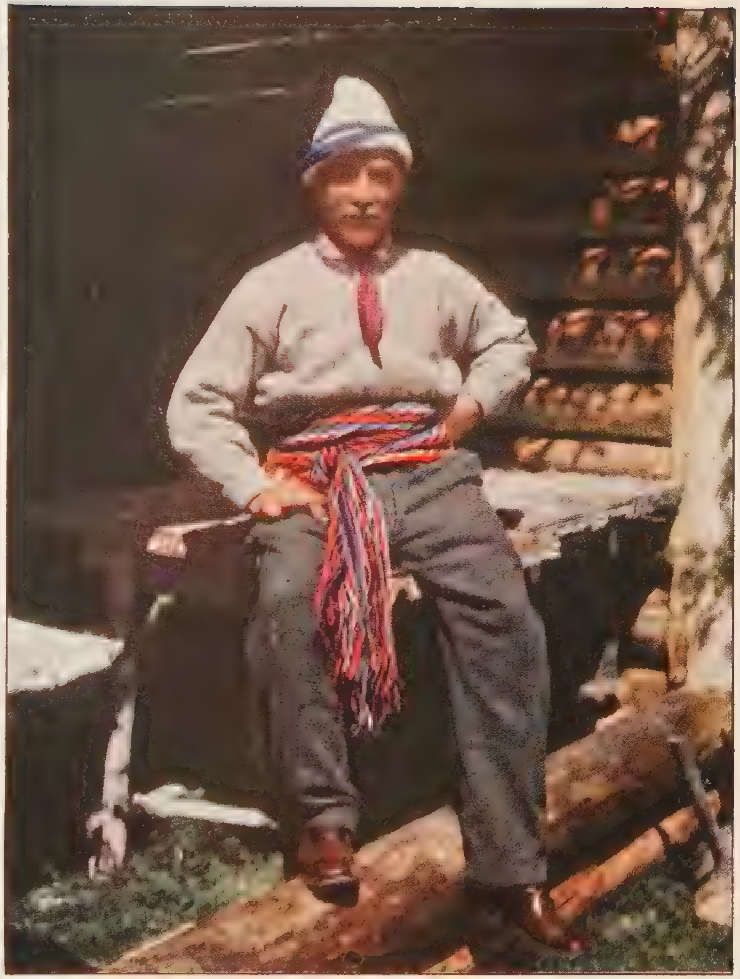
Natural-Color Photograph by William D. Boutwell

THE KING'S BASTION OF THE CITADEL OF QUEBEC OVERLOOKS THE LOWER TOWN AND HARBOR

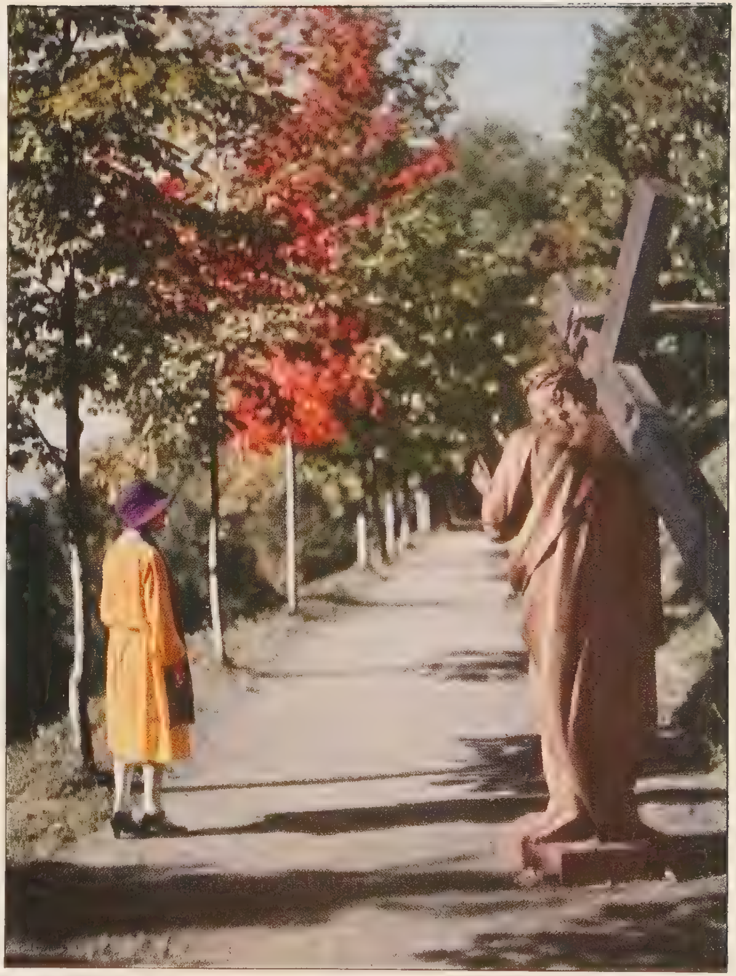
In the distance to the right is the Isle of Orleans, where the British under General Wolfe first landed in their successful campaign which ended on the Plains of Abraham.



© National Geographic Society Natural-Color Photograph by Edwin L. Wisherd

PROUD OF HIS HANDMADE "CEINTURE FLÉCHÉE"

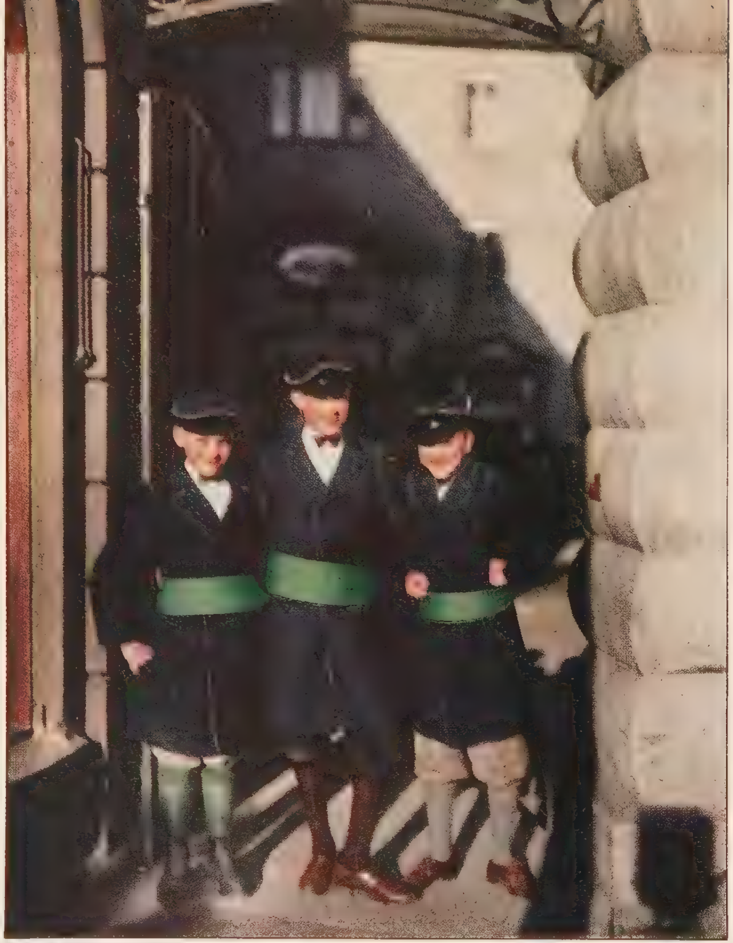
Even if Jacques's sash is an old one made of hard-twisted wool, dyed with natural colors and mellowed by age, it is worth money. *Ceintures fléchées* made by habitants are prized like Persian rugs or hand-woven ponchos of South and Central America. The weaving of fléchées, once almost a lost art, has been revived by the Provincial Government.



Natural-Color Photograph by William D. Boutwell

A VISITOR PAUSES AT A STATION OF THE CROSS

Bronze figures reënact the Christian tragedy by the quiet hillside paths of Ste. Anne de Beaupré, the Lourdes of the New World. On St. John the Baptist's Day, June 24th, and the day of days in French Canada, a colorful religious procession journeys from Quebec 22 miles to Ste. Anne, halting from time to time at wayside shrines.



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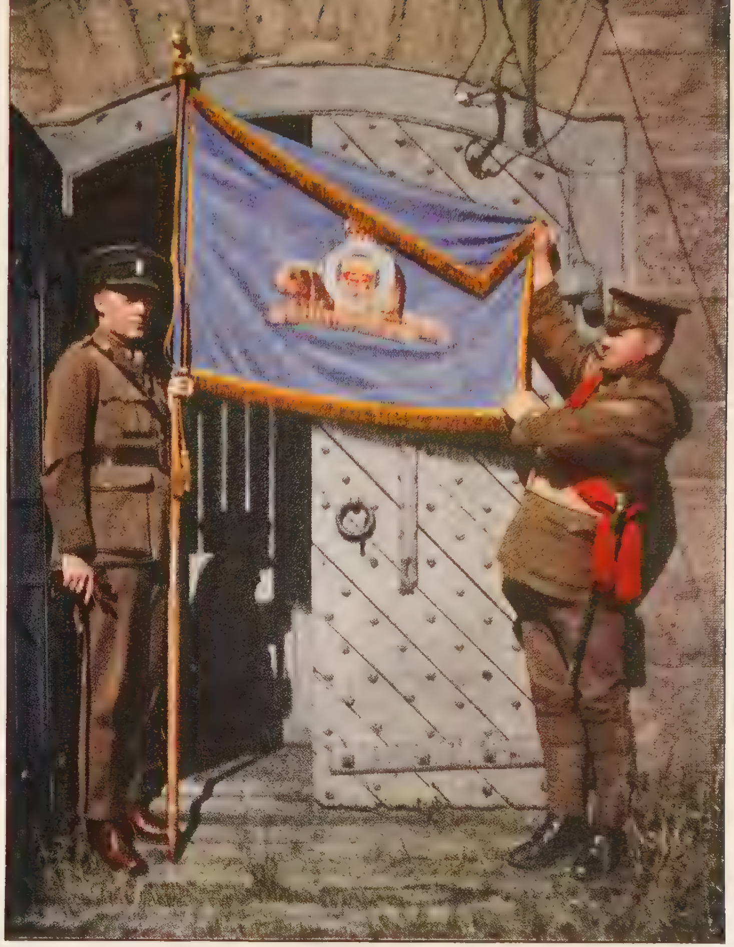
THEIR SCHOOL IS 264 YEARS OLD

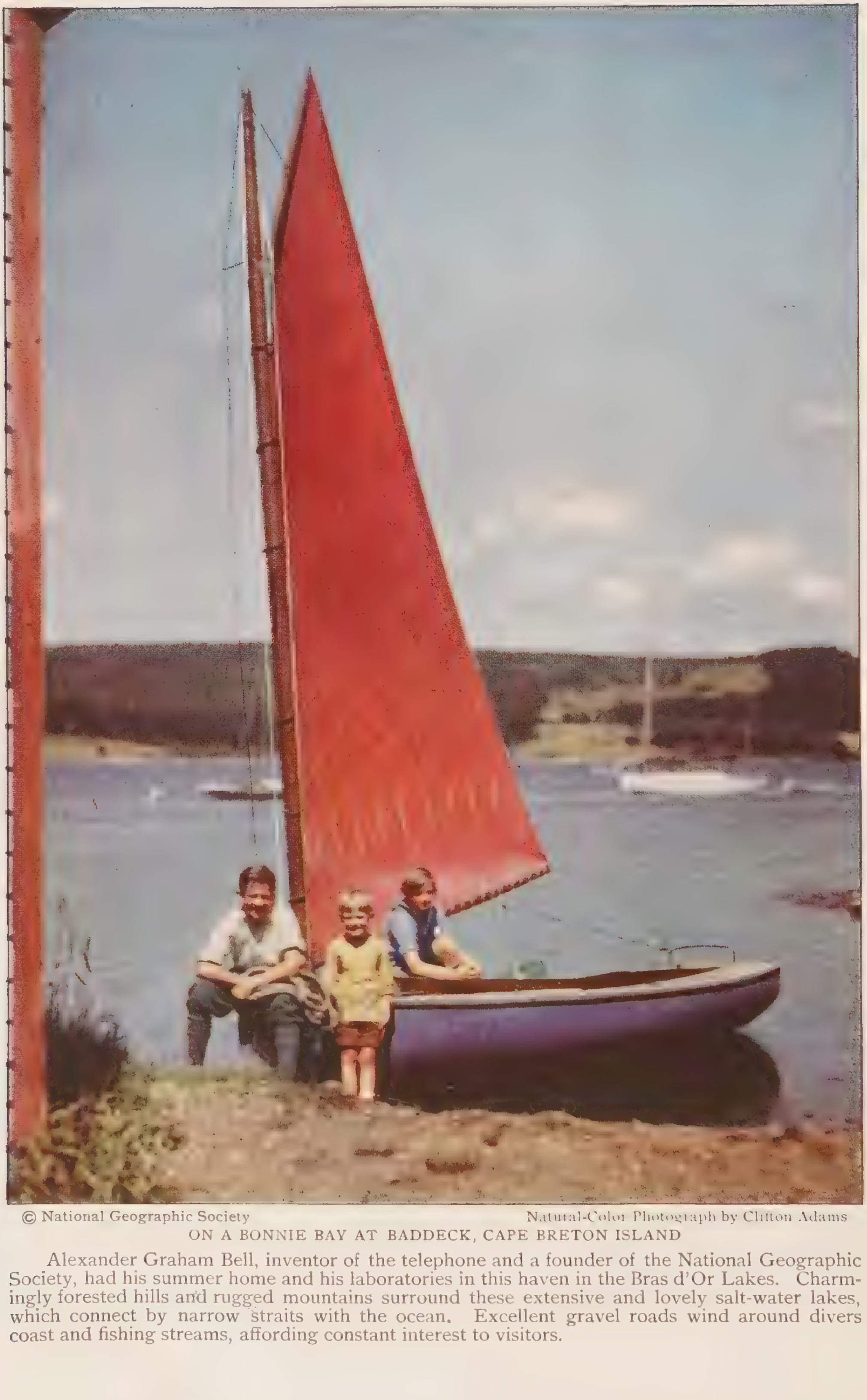
Quebec Seminary was founded in 1666 with 8 French boys, 6 Hurons and a few Algonquins. Laval University developed out of the Seminary. Boys who live in Lower Town have the fun of sliding down about 200 feet of iron guard railing on their way home from school.



Natural-Color Photographs by William D. Boutwell

FRENCH-CANADIAN SOLDIERS SHOW THEIR COLORS

French-speaking "Tommies" swear fealty to a regimental flag carrying the emblems of nations that were once sworn enemies. The lilies of France, the lion of St. George, and the maple leaves of Canada emblazon the Provincial escutcheon embroidered on the banner.



© National Geographic Society Natural-Color Photograph by Clifton Adams

ON A BONNIE BAY AT BADDECK, CAPE BRETON ISLAND

Alexander Graham Bell, inventor of the telephone and a founder of the National Geographic Society, had his summer home and his laboratories in this haven in the Bras d'Or Lakes. Charmingly forested hills and rugged mountains surround these extensive and lovely salt-water lakes, which connect by narrow straits with the ocean. Excellent gravel roads wind around divers coast and fishing streams, affording constant interest to visitors.

QUEBEC, CAPITAL OF FRENCH CANADA

BY WILLIAM DOW BOUTWELL

NOT until one ferries out to the front gate, near the Isle of Orleans, turns about, and steams up to the city from down river—not until then can one feel the full grandeur of Quebec. To do this is to approach the rock as did the first white men.

The ferry trip to the Isle of Orleans suggests a theory of the city's origin. Jacques Cartier, who discovered in 1535 the site of Quebec, was a native of St. Malo, Brittany. Not many miles from Cartier's home port, Mont St. Michel pricks the sky. As a boy he doubtless saw the guardian tides flood the sands around its towering walls twice a day. He learned that battles might rage in France, but Mont St. Michel was never captured.

Imagine, then, his joy when he cleared the end of the Isle of Orleans and saw rising from a broad, blue bay in the river a great rock, like Mont St. Michel, a natural fortress. Before him the blue St. Lawrence River went on into the west—to China, perhaps. To the right lay broad flats, at the St. Charles River mouth, where he anchored the *Grande Hermine,* the *Petite Hermine,* and the *Émerillon,* and where, the following year, he was to erect a great cross bearing the legend, "Francis the First, by the Grace of God, King of the French." No doubt Cartier expected the rock to be sheer on all sides, like Mont St. Michel, and was disappointed to find the side which cannot be seen from the harbor fastened solidly to the mainland.

A PERFECT SITE FOR AN AMERICAN GIBRALTAR

Nevertheless, Cartier recognized that this rock was the perfect site for a town, built, as 16th-century Europe often preferred to build a town, on a hilltop. A narrow land shelf skirts the rock's base, providing a natural wharf. On two water fronts Quebec's cliffs rise sharply. A handful of men could protect this height against an army, both Cartier, discoverer, and Champlain, founder of the city, believed—and with good reason. Quebec earned its title, "Gibraltar of America," by withstanding three sieges.

On top the rock of Quebec measures, within its walls, six average city blocks wide and about five blocks deep. Few houses, churches, and stores can be packed into so small an area, even by squeezing streets and cutting down sidewalks. All that could be erected have long been built.

Following one devastating fire, an inspired law required that all buildings be erected of stone; so ancient, time-stained fronts flank every narrow street and claim all Haute Ville (Upper Town) as a monument to the past. Basse Ville (Lower Town) occupies the narrow strip of land along the St. Lawrence and is the chief business center.

Around all Upper Town the British a century ago threw wide-bastioned walls, greatly reinforcing the French defenses. Gates at the tops of steep hills pierce these walls. British walls guarded by massive British cannon still circle the very heart of the old city.

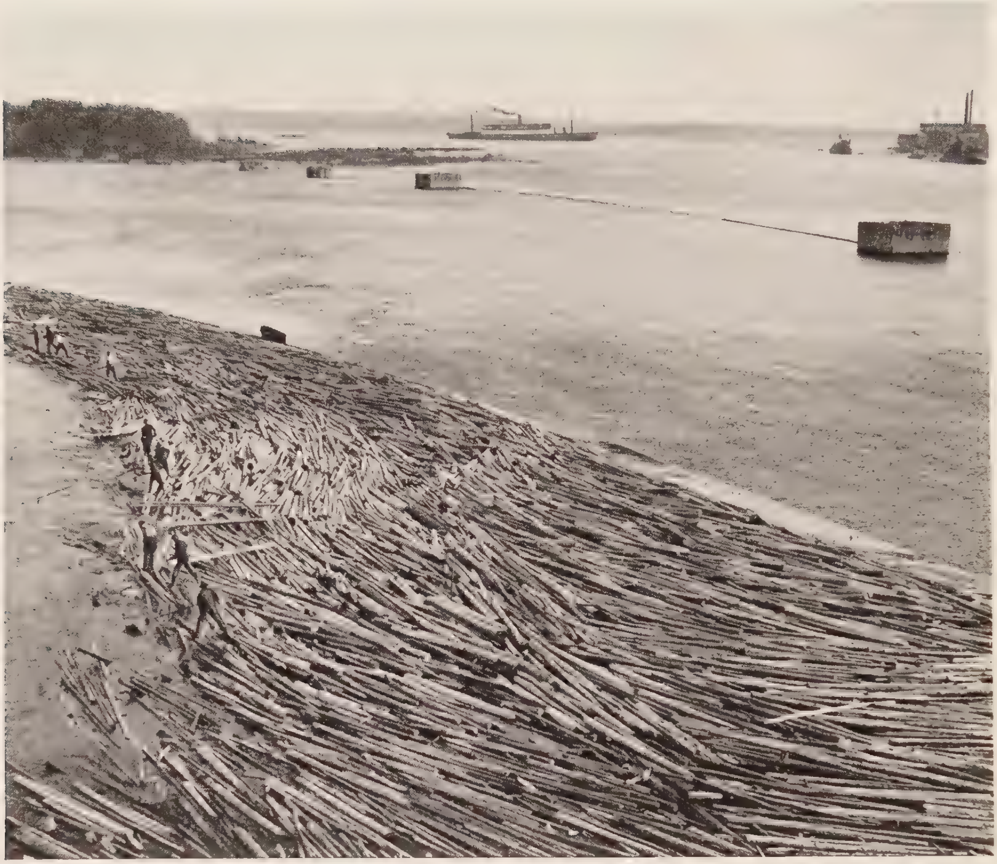
Everyone can give thanks for Quebec's preservation, because within the last few years Quebec Province has been discovered by industry; Montreal has become the leading wheat port of the world and commercial metropolis of Canada, while in its primeval forests the Province possesses an asset which is the envy of a paper-hungry world.

Outside capital has converted the tumultuous black rivers that foam out of the Laurentide Mountains into "white coal." Water power runs paper mills, aluminum mills, shoe factories, mills churning wood sulphite for rayon silk—mills of all sorts. Even the barren wastes of northern Quebec have been found to contain gold and other precious metals, which are drawing thousands of pioneers into the northland.

"AN ISLAND OF FRENCH IN A SEA OF ENGLISH"

"We are an island of French-speaking people in a sea of English," said Cardinal Taschereau, "so we feel compelled to live to ourselves in order to preserve our identity."

Waves of industrial progress steadily eat at the shores of the Cardinal's island. Go into the Province and you will be



Photograph by William D. Boutwell

WORKING THE LOGS ON A BOOM AT THREE RIVERS

The liner is in the St. Lawrence and is steaming toward Montreal. At the right is one of the largest newsprint factories in the world, producing 700 tons of newsprint a day from the pulpwood of Quebec Province forests.

surprised, at first, at the hold of the French-speaking, French-stock Canadians. Quebec City, seemingly more French than Paris, appears to be impregnable to the English flood. Here is a separate people, with distinctive language and customs. But the deeper one delves into French Canada, the more one wonders how long it can live in the "sea of English."

The changing present can be found in metropolitan Montreal; in Three Rivers, grinding mountainous piles of logs into newsprint stock; in Thetford Mines, dusty as a miller with white asbestos powder; at Lake St. John, where new pioneers fell old forests; in Arvida, where waterfalls and a new community have been dedicated to aluminum, and at Rouyn, luring men with gold.

The unchanging past can be found in Quebec, the old capital of New France; among the Norman cottages on the Beaupré Road, and in the pastoral serenity of the Isle of Orleans.

Quebec, though consecrated to another age, houses a busy people, as well as shades of a glorious past. What is more, the people one meets, the storekeepers and Government officials, all claim kinship with the shades.

HÉBERT, CANADA'S FIRST FARMER

From the Place d'Armes, near the Château Frontenac, walk past the Anglican Cathedral, one block down Rue de Ste. Anne. This pinched street opens into the sunlight of Hôtel de Ville (City Hall) Park. One cannot fail to see the splen-

Photograph by Bert Chesterfield

THE FRENCH TRADITION LINGERS IN THE ISLE AUX COUDRES

The natives of this St. Lawrence River island are believed to be more purely 17th-century French than any other Canadian groups. Though the farmer uses a modern mowing machine, his domain remains just as it was when the house was built, centuries ago. Cartier discovered the island (northeast of Quebec City) and gave it its name, which means "Hazel Island."

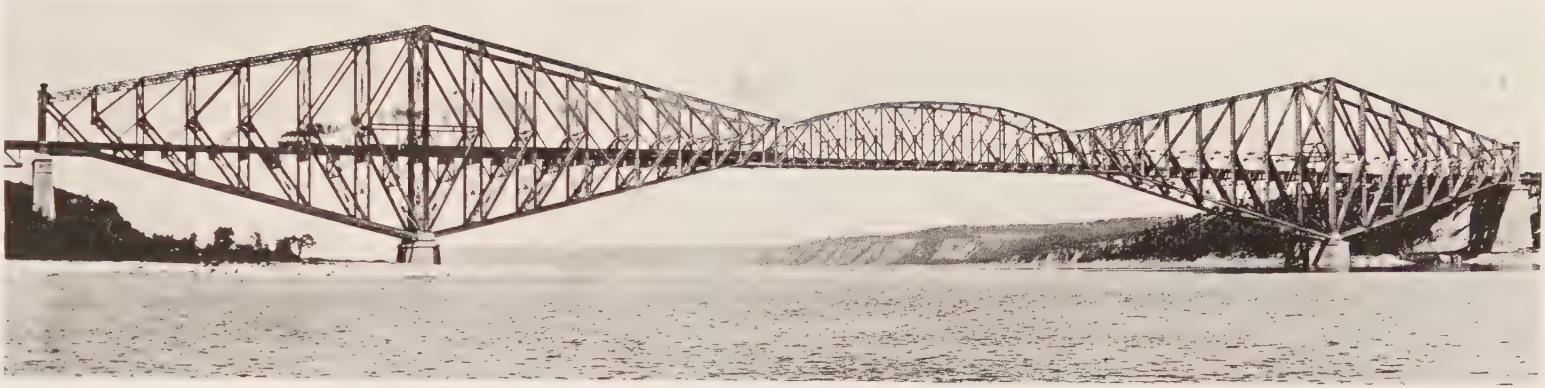
did statue of Louis Hébert framed there against the granite entrance. Of Hébert, the Parisian pharmacist who left his mortar and pestle to become Canada's first farmer, citizens of Quebec are very fond.

But one should see especially a bronze plate on the base of Hébert's statue bearing 71 names, French Canada's *Mayflower* list. The first 11 names are of those pioneer farmers who came to New France between 1615 and 1641. They are: Noël Langlois, Charles Le Moine, Paul de Rainville, Nicholas Bélanger, Gaspar Boucher, Jean Hébert, Jacques Gourdeau, Guillaume Couillard, Abraham Martin, Jean Côté, and Jacques Scelle.

The other 60 came within the 25 years following 1641. The names on the bronze plate, one soon discovers, are the names on stores and offices lining the streets of Quebec: a Langlois is a dentist on Rue de St. Jean; a Bélanger's sign *Marchands de Nouveautés* faces Rue de Notre Dame; a Le Moine, Sir James Le Moine, wrote charming tales of Quebec displayed in the bookstores; a Couillard is a grocer, and a Hébert runs the St. Malo Garage.

The shades of the past and the citizens of the present are indeed related!

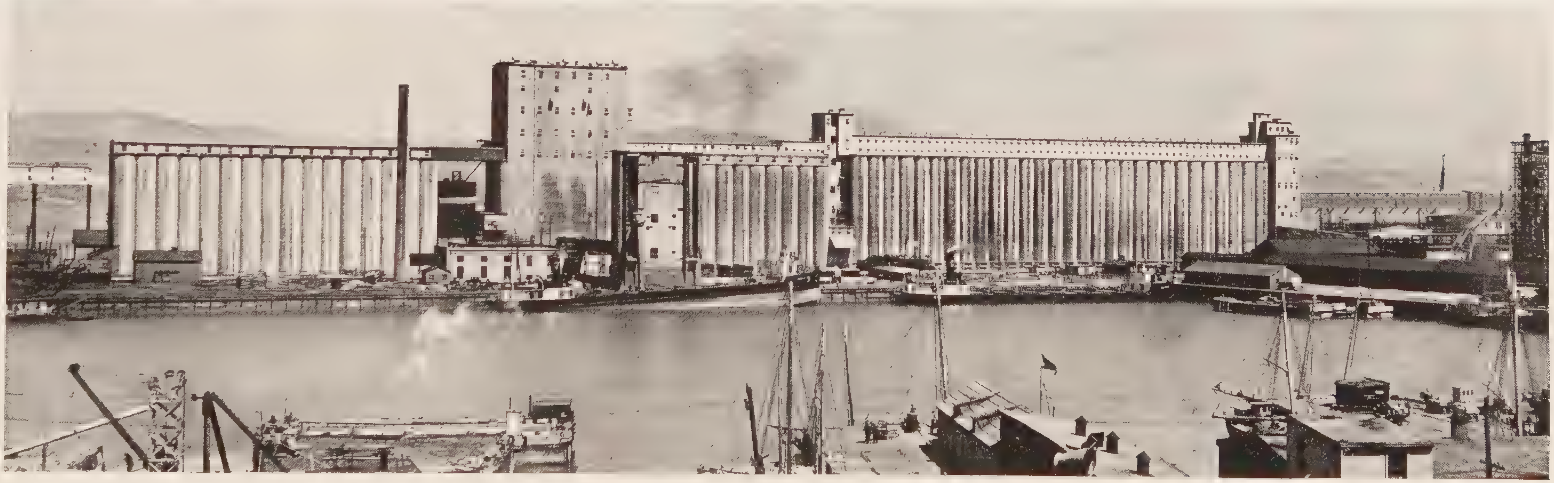
In the Quebec telephone directory one may find listed citizens bearing the names of each of the original 11 settlers save Jacques Scelle. Testing the whole list of 71 names by the directory, it is found that 60 fathers apparently supply 1,600 names out of 13,000 in the Quebec



Photograph Courtesy of Canadian Government Motion Picture Bureau

THE QUEBEC BRIDGE, SPANNING THE ST. LAWRENCE, IS ONE OF MAN'S GREATEST ENGINEERING FEATS

Over the structure passes the transcontinental railway line from the south to the north banks of the St. Lawrence, as well as vehicular and pedestrian traffic. It has a total length of 3,229 feet, the center span is 1,800 feet, and the length of the suspended portion of the center span is 640 feet. For a length of 760 feet the center span is 150 feet above the high-water level of the river. Twice the bridge collapsed during construction.



Photograph by Ewing Galloway

QUEBEC HARBOR'S GRAIN ELEVATORS, INCLUDING THE LOADING GALLERIES AT EACH END, ARE NEARLY HALF A MILE LONG section. There are 170 Côtés, 93 Bélangers, 55 Langlois, 43 Bouchers, and 21 Héberts. The Côtés are the Smiths of Quebec.

A COLONY INTACT FOR THREE CENTURIES

Families do not die out in French Canada. Every French-Canadian, it is said, knows who were his first ancestors in America, the French town from which they came, the ships they sailed on, and the date on which they arrived in Quebec.

How have they kept their colony intact through 300 years?

One answer is that the families brought over by Samuel de Champlain and Intendant Jean Baptiste Talon have been content to occupy a region in which the English in North America have not been interested—at least not until forests and water power suddenly acquired roseate values. Neither gold in California nor wheat in Manitoba could stampede the French-Canadians. They would not give up their St. Lawrence farms, although many of their sons and daughters have pioneered in the West. They have endured a rigorous climate with a hardihood aptly hit upon in one of the most famous of Kipling limericks:

> "There was a young boy of Quebec,
> Who fell through some ice to his neck.
> When asked, 'Are you friz?'
> He replied, 'Yes, I is,
> But we don't call this cold in Quebec.' "

French-Canadians love their land and homes with a deep affection. More than 200 families still occupy the same farms that were first plowed by their own ancestors in the 17th century.

On paper their home, Quebec Province, sprawls with tremendous acreage, yet it is small. Officials have under their direction at the Government buildings in Quebec an area more than twice the size of Texas; actually they concern themselves chiefly with a narrow, populated corridor with many branches.

THE BIRTHRATE COMBATS THE MELTING POT IN NEW FRANCE

The St. Lawrence unrolls a beautiful blue ribbon on which French-Canadians have strung farms, villages, and cities like pretty beads. Civilized and cultivated Quebec is a necklace; the rest of the Province is, as they say, "bush."

The second explanation of French-Canadian resistance to the North American melting pot can be found in birthrate figures. While France itself has a very nearly stationary population, New France, in America, has one of the highest rates of natural increase among civilized countries.

A few years ago the Provincial Government embarked on a policy of encouraging colonization in undeveloped valleys of the Laurentide Mountains. As an inducement, it at one time offered as a gift 100 acres to any prospective colonist who had 12 children. Land office clerks were confronted by some ambitious fathers demanding 200 acres, claiming headship of families of 24 or more children.

Canada held some 60,000 French when General Montcalm surrendered. This severed colony, which sprang from 10,000 immigrants, has increased in North America to a people estimated to number 3,500,000. They comprise more than one-fourth of the population of all Canada and more than half of the population of the Dominion's largest city, Montreal. There are about 1,000,000 French-Canadians in the United States who were born in Canada and others are coming every year. Her children are one of Quebec's chief exports. Thousands have become capable workers in American textile mills and factories.

SETTING FOOT ON THE SHORES OF HISTORY

One sets foot on the shores of history at the Quai du Roi, near where the Lévis ferries dock every fifteen minutes. Let the traveler forget the ferry and pretend instead that he treads a ship's decks with Champlain, landing in 1608 to found Quebec. Once on shore, be prudent and leave Champlain immediately, for of his company, numbering 28 in all, 20 died before spring.

Wait on the Quai as the years pass, until another boat arrives with a passenger list worthy of the front page. All Quebec gathers on the dock. Quebec opens wide its arms to that most distinguished arrival, Bishop Laval, who has returned from France with renewed resolution to put the governors in their places.

Photograph by Bert Chesterfield

CHILDREN RUN THEIR ERRANDS IN OLD-TIME DOG CARTS: ISLE OF ORLEANS

Hard on the Bishop's heels comes a stout priest, Father Louis Hennepin, uttering maledictions on his fellow voyagers because on the way over they danced and sang. Hennepin's protests and even the Bishop get lost in tumultuous shouting and cheering, as a cargo of girls pours over the ship's side—*filles du roi,* daughters of the king—French girls sent to Quebec, then a man's world in need of wives.

And who danced with them? Who sang with them to Hennepin's disgust? A young man with curly hair and the face of a boy, René Robert Cavelier, Sieur de La Salle, arriving in New France, bound for the mouth of the Mississippi.

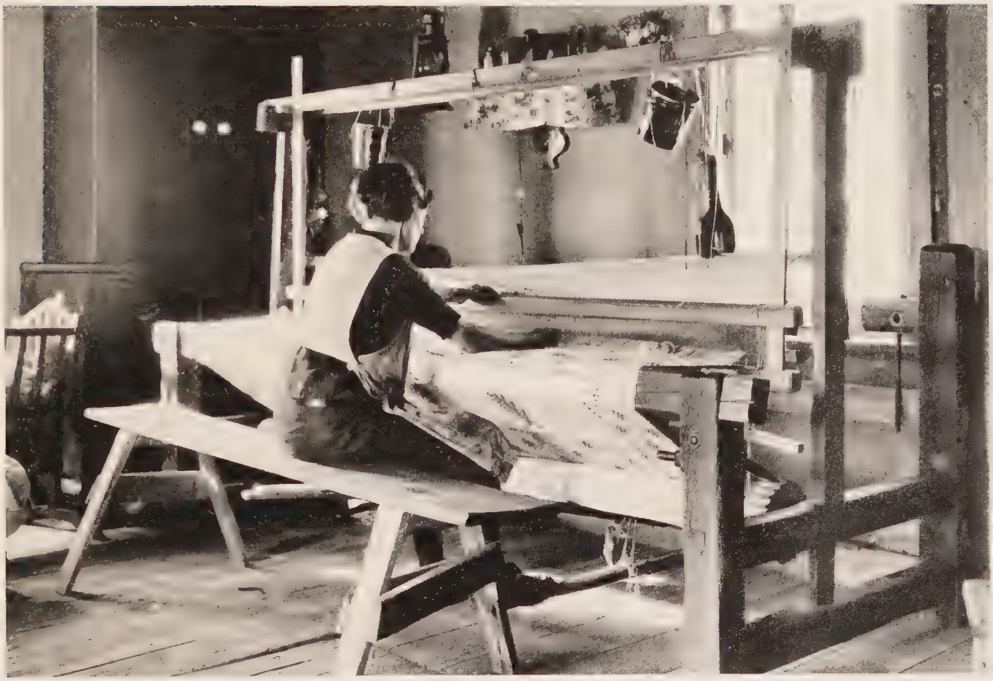
NORTH AMERICA'S MOST EUROPEAN SQUARE

Now we shall leave the Quai to walk through the market square to Rue de Notre Dame. Canada's oldest street is a gloomy way, because over the narrow passage fall two shadows, one from the grim walls of old buildings and one, more threatening, from the rock cliff. A brief block and one emerges into the most European square in North America. It was the business center and the social center of colonial New France, for here Champlain set up his headquarters and here met the market in days gone by. Then it was peopled with venders of vegetables, bright fruit, and squawking chickens.

Louis XIV in metal looked down on his colonists from a pedestal in the center of the square. On the west side the church Notre Dame des Victoires has presided over the square since 1688. In October each year citizens still observe in Notre Dame the celebrations first held in thanksgiving for the rescue of Quebec from siege by Anglo-American Colonial forces under Phips, forces known to French-Canadians as *les Bostonnais.*

Those weak of leg have the option of taking the municipal elevator, in near-by Little Champlain Street, which whisks one up the cliff face to Dufferin Terrace, Upper Town, for seven cents; or of trudging the way of true history pilgrims, up Côte-de-la-Montagne. Mountain Hill is the English of it, and if that be redundancy it was never more warranted. It is a good automobile that makes it on high.

Champlain built his governing palace in Lower Town, but the permanent Gov-



Photograph by Bert Chesterfield

DAINTY NORMANDY PATTERNS ARE WOVEN ON PRIMITIVE LOOMS: ISLE OF ORLEANS

ernment headquarters, called Château St. Louis, rose on the cliff where the Château Frontenac now outspires and outtowers the most kingly palace of the River Loire.

The Château St. Louis continued to be an executive mansion from which governors ruled over varying areas of Canada, the Great Lakes, and the Mississippi Valley for more than 50 years longer than Presidents have occupied the White House in Washington, D. C.

Explorers from the West, fur traders from the Ottawa River, messengers from the kings of France, seigneurs come to do annual homage, new governors, new colonists, new prelates, all had to climb Mountain Hill to the Château St. Louis. Benedict Arnold, at the head of American troops, tried to fight his way to the top, but failed.

There is need for rest and reflection on the way up.

AMERICAN TOWNS, HOTELS, AND LAKES MEMORIALIZE FRENCH PIONEERS

Citizens of the Mississippi Valley, the Great Lakes basin, and the shores of Lake Champlain and the Finger Lakes, in particular, should climb Mountain Hill. To them the French explorers, missionaries, and soldiers are very real heroes.

The citizen of Joliet, Illinois, knows that Joliet camped on the site of his town; a dweller on the Ohio River knows that a lead plate claiming his land for France may be turned up any day; a resident of Wisconsin realizes that each time he pronounces his State's name he respects the French christening of the region in accordance with its Indian name.

Everyone who lives in Louisiana, Mississippi, Missouri, Arkansas, Tennessee, Kentucky, Ohio, Indiana, Illinois, Iowa, Minnesota, Wisconsin, Michigan, Ontario, and Manitoba must regard Quebec as once the capital of his country.

Men from the St. Lawrence were the fathers of many great cities of these Commonwealths: Marquette and later the Jesuits Pinet and Binneteau founded Chicago by the Rivière de l'Ail (Garlic River); Laurent Salomon Juneau, Milwaukee; Pierre Laclède Ligueste established St. Louis; Cadillac, Detroit; Julien Dubuque, miner and trader, Dubuque, Iowa; Sieur Du Lhut, Duluth; Bienville, the soldier, New Orleans; and Iberville, his brother, Mobile, Alabama.

Up Mountain Hill went Louis Joliet and Père Jacques Marquette to receive orders from dour Governor Frontenac. He sent them off on a canoe expedition which resulted in the exploration of the upper Mississippi River. Up the hill alone, on his return, went Joliet to draw from memory, for the governor, a map of their astonishing find, for Joliet lost the records and nearly lost his life shooting the Sault St. Louis (the Lachine Rapids).

Up Mountain Hill went René Robert Cavelier, Sieur de La Salle, to tell that New France now stretched to the Gulf of Mexico, and Father Louis Hennepin, to tell how Niagara Falls thundered; also to tell of reaching the falls where now stand Minneapolis and St. Paul, and of being captured by the Sioux.

FRENCH HEROES WERE BELOVED CITIZENS OF QUEBEC

North America knows these intrepid Frenchmen to-day through names of lakes, hotels, automobiles, steamboats, and towns.

But in Quebec these heroes are preserved in memory as citizens. The Angelus rings three times a day. Each time it recalls that Champlain so ordered the ringing. Joliet played the organ in the Basilica which you see as you gain the top of Mountain Hill.

Sieur de Cadillac, who saw in Detroit, even in his day, "a Paris of the West"—well, in Quebec, Cadillac is the man who married the beautiful daughter of the rich merchant Guyon. And he it was who vowed a chapel to the monastery if he recovered from a dread sickness. God gave him life, so he built it. Father Hennepin is a missionary who rested from his exhausting adventures among the Indians in the Récollet Monastery which is now the General Hospital. Charlevoix, the famous historian and inspecting missionary, in Quebec is Charlevoix, one of the first to praise the beauty of Quebec's girls.

Down in the vaults of the Basilica across the cobbled street is the tomb of Count Frontenac. Twice a king of France made him governor, and twice he saved New France from ruin. Each time Count Frontenac came to America without the Countess, for she preferred the gay life of Versailles. His pocketbook would not support two at court.

The Basilica is the pantheon of French colonial heroes, although the new stone of its walls, replaced since the devastating fire of 1922, belies its ancient dignity. Bodies of Count Frontenac and other governors, many church dignitaries and soldiers, lie within its vaults, and evidence points toward the supposition that the lost grave of the courageous Champlain exists within the foundations.

Where French Canada takes her stand to-day, in reference to France, in reference to England and the British Empire, and in reference to the Canadian Government, French-Canadians answer for themselves in three words: *Je me souviens.*

On the Provincial seal appears *Je me souviens.* On the flag of the Royal 22d French-Canadian Regiment at the Citadel appears *Je me souviens.* On the fine bronze standards marking historical sites appears the motto *Je me souviens.*

"Just what does *Je me souviens* mean?" I asked a French-Canadian.

"It means," he replied, taking a long breath, "that although we give our loyalty to the British Crown and although we consider ourselves an integral part of the Dominion of Canada, we respect and remember the courage of our ancestors in planting a colony on the shores of the St. Lawrence River and we pledge ourselves to keep intact the civilization which they so nobly began."

* * *

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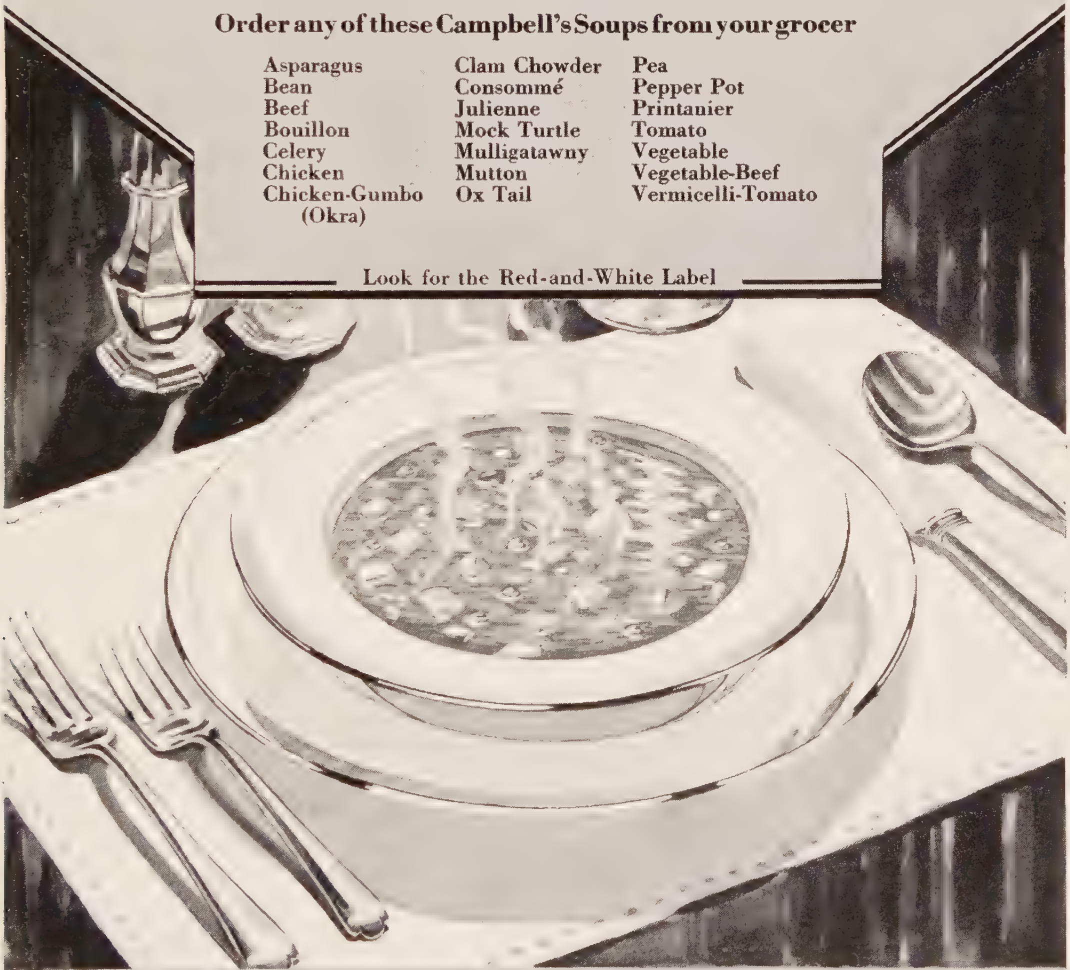

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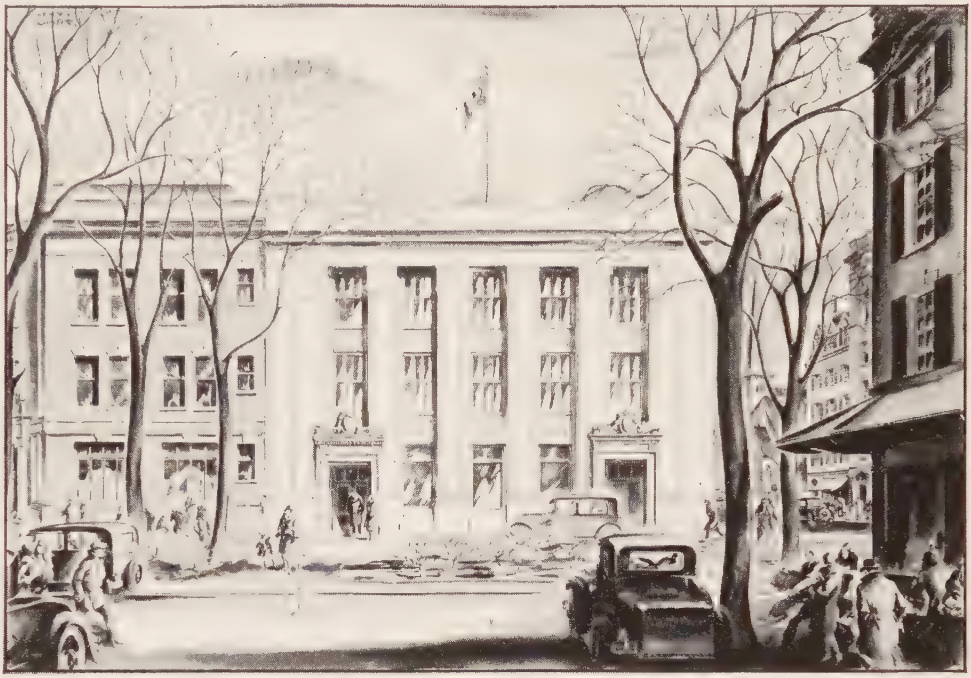

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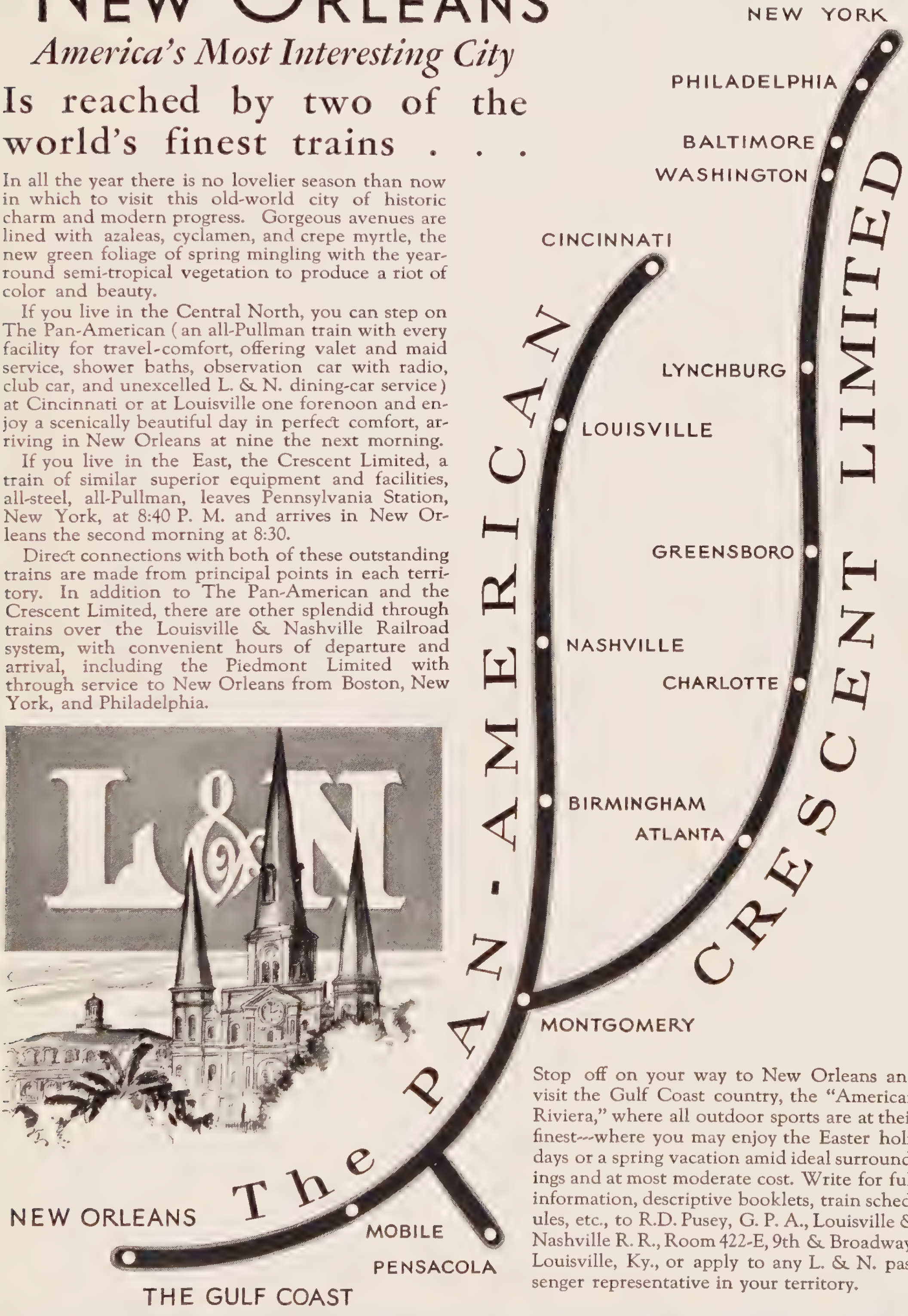
Direct connections with both of these outstanding trains are made from principal points in each territory. In addition to The Pan-American and the Crescent Limited, there are other splendid through trains over the Louisville & Nashville Railroad system, with convenient hours of departure and arrival, including the Piedmont Limited with through service to New Orleans from Boston, New York, and Philadelphia.



Stop off on your way to New Orleans and visit the Gulf Coast country, the "American Riviera," where all outdoor sports are at their finest—where you may enjoy the Easter holidays or a spring vacation amid ideal surroundings and at most moderate cost. Write for full information, descriptive booklets, train schedules, etc., to R.D. Pusey, G. P. A., Louisville & Nashville R. R., Room 422-E, 9th & Broadway, Louisville, Ky., or apply to any L. & N. passenger representative in your territory.

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Cool Trade Winds Banish Summer Heat in Hawaii

POISED on the crest of a gathering wave a daring outrigger pauses an instant, then dives down a valley of curling brine. . . . Straight for the shore it darts, a skimming arrow on a blue expanse. . . . Flying spray forms a halo of gleaming iridescence . . . silhouettes bronzed figures immobile and erect like fabled gods astride a steed of the deep—

Whether Hawaii to you in the lovely late summer means dreamy days on coral shores or active participation in the water sports of old Hawaiian kings . . . whether fancy dictates a round of golf in settings of breath-taking beauty or rambles through tropic forest fastnesses . . . whether your mood craves the quiet glory of a magic night under the calm of a star-laced sky or the gaiety and sparkle of Continental smartness in great hotels . . . the Paradise Isles offer the vacation you'll never forget.

Write today for information . . . for the story of Hawaii in Summer and Fall and the joy of going. . . . Learn how easy it is to get there on proud liners that make the trip in four to six days from the gateways of the Pacific. . . . Know for yourself how trade winds banish the worry of heat . . . make Hawaii the Land of Perpetual Spring . . . carry Summer into Fall.

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(HONOLULU, HAWAII, U. S. A.)

for full information write to

1104 Monadnock Building, San Francisco, Calif.
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or communicate with

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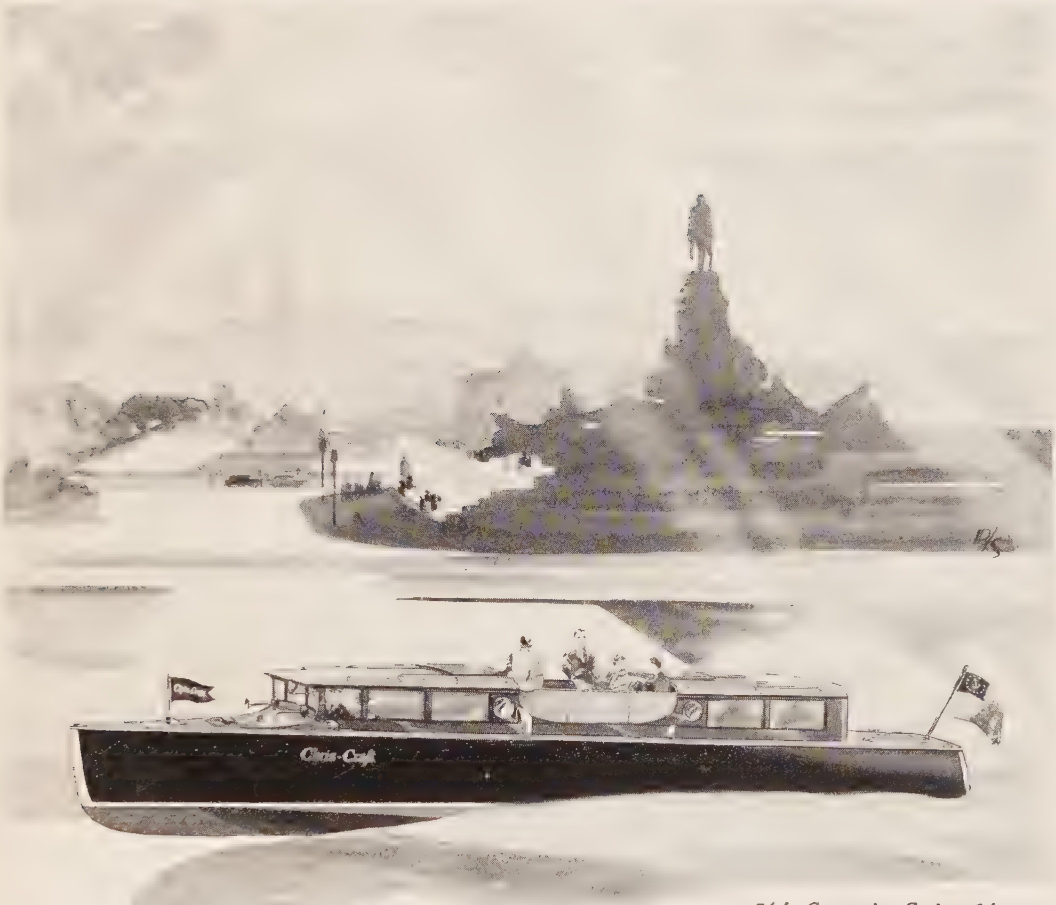
271 Pine Street - - - - - - Portland, Ore.

Any travel agent will gladly give you full particulars and arrange your bookings



34 ft. Commuting Cruiser, 14 passengers, speed up to 40 M. P. H., two 200 H. P. Marine Motors, $15,000

WHAT a way to entertain—the Chris-Craft way! So fast is Chris-Craft—so safe and so luxurious—it brings within reach the sports and recreations of the whole coastline! Every Chris-Craft inevitably becomes a social center. Whole parties may go in restful luxury at express train speed to distant regatta, dinner or dance—to sports and recreations everywhere on water ❧ ❧ ❧ With a Chris-Craft you find yourself more frequently invited and more frequently inviting social contacts with really worth-while folks. The boating set is a cheery, happy family, socially active and socially worth-while. Industrial leaders, statesmen and bankers find Chris-Craft the means to secure needed rest and recreation in limited time ❧ ❧ ❧ Let Chris-Craft solve your recreation and entertainment problem. Between the nimble twenty-foot runabout and the stately Chris-Craft yacht is the widest range of pleasure craft ever offered. All are luxuriously cushioned, all are seaworthy, safe and fast. All have automobile type controls and starting, lighting and steering devices. Chris-Craft merchants throughout the world will demonstrate and describe the various models. Illustrated catalog may be had by writing Chris Smith & Sons Boat Co., 764 Detroit Road, Algonac, Michigan.

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New and Different at slightly higher cost

THE spring-center mattress was a great stride forward. It taught us all that light-hearted buoyancy, *not weight*, is the real source of comfort. Yet it was no more than a single step toward the supreme sleep luxury brought to you now by modern, beautiful SPRING-AIR.

Instead of ponderous bulk and weight, here are compact, graceful lines and a lightness that a child can handle. In place of rigid frames, knotted wires, and pocketed springs that catch and hold the dust, here are covers as removable as pillow slips, sanitary beyond any cushioning ever before devised.

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Leading hotels, hospitals and sanitariums acclaim its super-comfort. You will want it in your home—for its convenience, its long life—*guaranteed for 20 years!*—and above all for its supreme sleep luxury. Ask for Spring Air at the better furniture and department stores.

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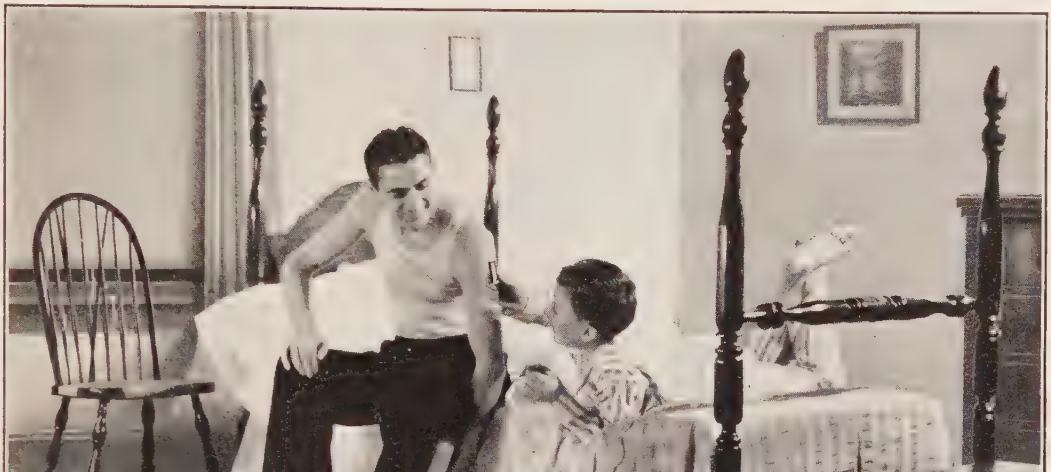
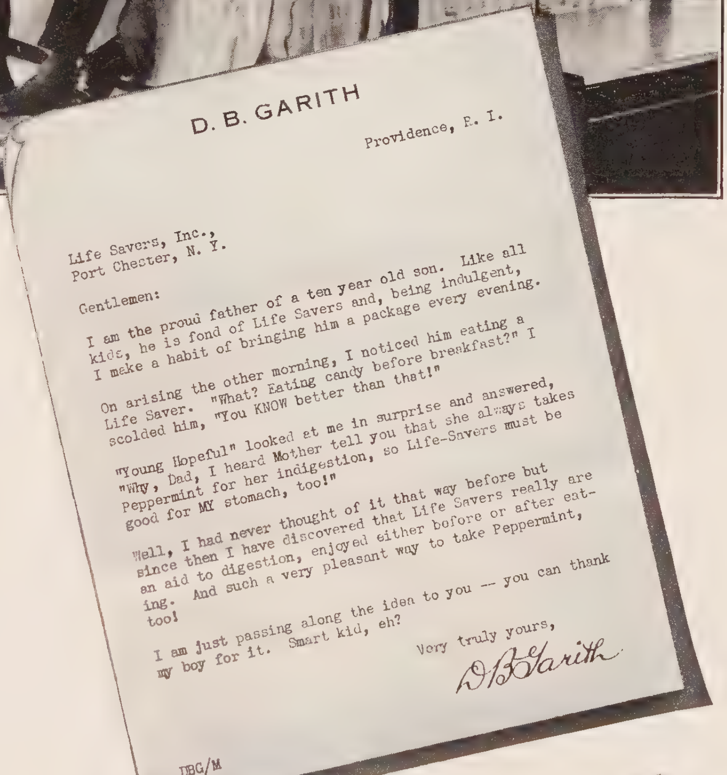




D. B. GARITH

Providence, R. I.

Life Savers, Inc.,
Port Chester, N. Y.

Gentlemen:

I am the proud father of a ten year old son. Like all kids, he is fond of Life Savers and, being indulgent, I make a habit of bringing him a package every evening.

On arising the other morning, I noticed him eating a Life Saver. "What? Eating candy before breakfast?" I scolded him, "You KNOW better than that!"

"Young Hopeful" looked at me in surprise and answered, "Why, Dad, I heard Mother tell you that she always takes Peppermint for her indigestion, so Life-Savers must be good for MY stomach, too!"

Well, I had never thought of it that way before but since then I have discovered that Life Savers really are an aid to digestion, enjoyed either before or after eating. And such a very pleasant way to take Peppermint, too!

I am just passing along the idea to you -- you can thank my boy for it. Smart kid, eh?

Very truly yours,

D B Garith

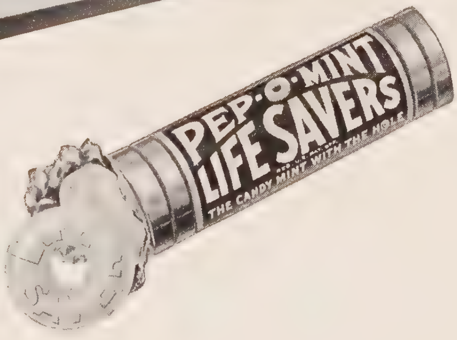
DBG/M

*FREE!

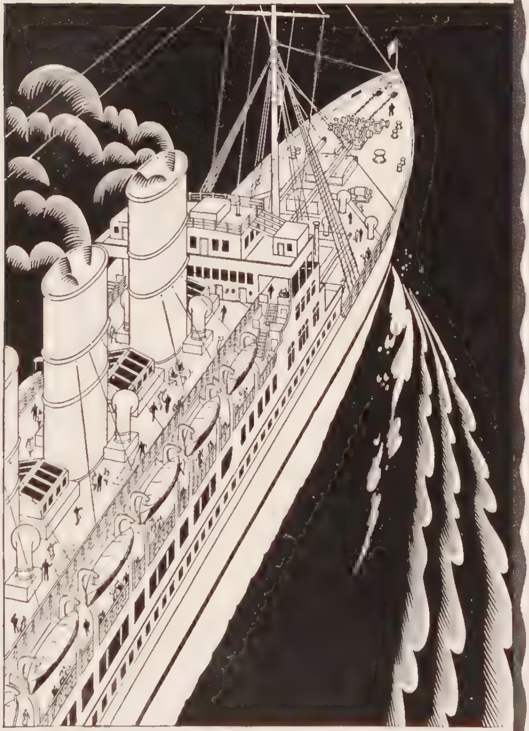
THIS interesting letter is similar to many which Life Savers, Inc., receives. For accepted letters such as this, Life Savers, Inc., Port Chester, N. Y. will send to the writers FREE a box of assorted Life Savers.

So many people have had unique experiences with Life Savers that we are very interested to know about them. What have you discovered about Life Savers? When do you and your children enjoy them most? Don't you find that they help digestion, sweeten the breath, soothe the throat and are very delightful after smoking?

Why not write us your letter today?



Baby brother takes the air in Tokyo . . .



. . . less than ten days away, via the huge white Empresses

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. . . nearer

. . . nearer

THE Pacific has its miracle, too! The Orient is coming nearer and nearer. This year, it suddenly looms over the horizon and beckons . . . 1,000 miles nearer the American shore.

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Take the paradise route via Hawaii . . . or the express route, Vancouver and Victoria straight to Yokohama, the fastest Pacific crossing.

Ask for booklets telling about the new, simplified way of touring the Orient. Information, reservations and freight inquiries from your own agent, or from any Canadian Pacific office: New York, Boston, Philadelphia, Washington, Chicago, Montreal, and 27 other cities in the United States and Canada.

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in America's Adventureland

Do you know the thrill of luncheon on some high mountainside, with miles and miles of pine forests spread out at your feet, and the keen breeze of six thousand feet ruffling your hair?

Come and hike with us . . . up a winding trail through the clouds, to a meadow gay with wild flowers, where the air is always bracing, and the sunshine always bright!

Glacier Park—on the main line of the Great Northern—or perhaps you prefer the Puget Sound country, where Mount Baker, wreathed in eternal snow, gazes at old Rainier. Then there's the Columbia River region, with Mount Hood brooding over the fat valleys; or Alaska, maybe . . . .

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EMPIRE BUILDER

The Luxurious
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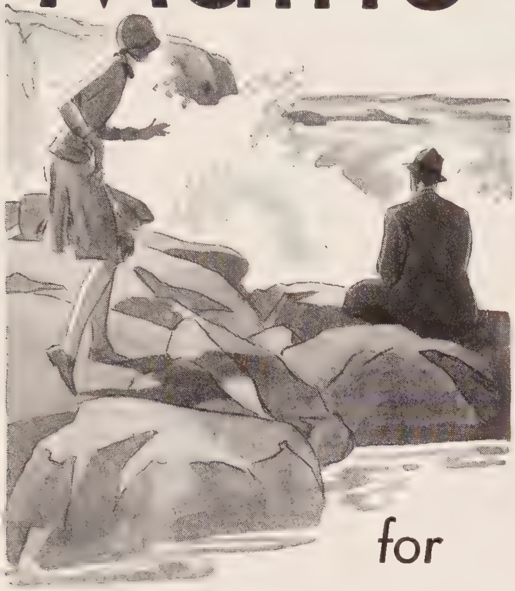

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Each fully automatic and independent of the other

BEARING in mind the finality of your investment in an electric refrigerator, it is important that you study it from the standpoint of tomorrow's needs as well as today's necessities.

In designing the new Super-Automatic Kelvinators, Kelvinator engineers have built with an eye to the future.

They saw immense strides being made in the development of methods for shipping frozen fruits, meats, fish—*fresh* from packer to consumer.

They saw the need for keeping such foods in the home at very low temperatures until used. So they built into the De Luxe Kelvinator models of today, a separate cold storage compartment with below-freezing temperature.

But Kelvinator engineers have gone further than this in anticipating refrigerating requirements of the future. They have made each of the *four functions* of an electric refrigerator completely automatic and independent of the other.

They have originated Iso-Thermic Tubes, giving for the first time *fully automatic fast freezing* of ice cubes and desserts. They have retained the normal speed of freezing ice and desserts in separate compartments. And they have held the food compartments at safe, scientific temperatures—uniformly between 40 and 50 degrees.

See the new Super-Automatic Kelvinators today and note the wide margin by which they increase Kelvinator's reputation for reliable, wholly automatic service. Write for illustrated folder describing the new Kelvinators. Mailed free upon request.

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In the great, new fleet of Dee Wite All-Mahogany runabouts will be found a model to meet every purpose. Eleven magnificent models to choose from! 16 and 19 feet long. Four, 6 and 8 cylinder power plants. 20 to 40 m.p.h. speeds. Every one a dry, safe, roomy and easy-to-handle boat that will bring you and your family and friends endless pleasures this summer.

Spend leisure summer hours on the water away from the heat, noise and dirt of the city. Entertain in a distinctive and delightful way. Commute back and forth to the city. Speed away to distant fishing haunts, picnic spots, bathing beaches.

Go to your Dee Wite dealer today and inspect these unusual boating values, or mail coupon for fully descriptive catalog. Early orders insure delivery when wanted. Convenient time payments if desired.

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The MILWAUKEE ROAD
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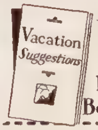
Electrified over the Rockies to the Sea



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Northward from San Francisco, halfway south from Portland, a shaggy California shadow stretches into Oregon and underneath it there's a day that took 2000 years to make. It is the day en route to California, or back again, that sees you through the Redwood Empire.

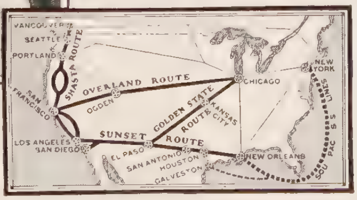
Here is an empire ruled by giants. Forest giants, century-laden yet straight and tall—and haughty in the winds from that eternal sea that surges at their feet. These are trees whose branches inching skyward for 2000 years, have seen Spain's Conquistador and Padre plod the Sunset Trail to found San Francisco... the early pathfinders struggling through the Sierra's snows to blaze the Overland Trail. They heard that startled shout *GOLD* and watched this West blaze up in a yellow frenzy, then turn to green for the nation's table; and build great cities.

From secrets of another age... an old tranquillity, these branches change to whisper of a hundred newer days, checkered here and there throughout the long Pacific Coast. Days in sparkling cities. Sport-filled days in a varied group of great resorts. Days that drowse you with the lazy song of waves from far-off oriental shores.

You can crowd ten vacations into a single Southern Pacific trip along the Pacific Coast — that brave sweep from San Diego to the Evergreen Playground of the Pacific Northwest.

The Pacific Northwest... Mt. Baker, Seattle, Tacoma, Mt. Rainier, the mighty Columbia, Portland and Mt. Hood, Crater Lake—Nature's thrilling mystery... all can be included in your ticket to or from California when you go one way and return another on Southern Pacific's four great routes. Southern Pacific is the only railroad that can show you the whole Pacific Coast. In no other way can you so quickly, comfortably and economically see it. You can stopover anywhere on round-trip tickets.

World famous gardens contribute to Southern Pacific's unsurpassed dining car service.



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Operates automatically

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Your Only Protection

is Chamberlin In-Dor-Seals. Whenever bedroom windows are open, bedroom doors are virtually outside doors. The extra large crack under bedroom doors becomes a source of draughts that chill every room in the house. This means uncomfortable morning temperatures and fuel waste. At a nominal cost Chamberlin In-Dor-Seals will permanently stop these draughts. In-Dor-Seals also deaden sounds and prevent room to room circulation of dust and odors. Put them on bedroom, closet, kitchen and bathroom doors. Installed by Chamberlin everywhere. Write for facts and free estimate.

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Representatives and dealers wanted. Write for particulars

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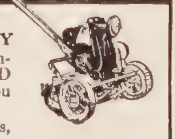

MOWING MADE EASY

You can not appreciate the convenience and economy of a RED E Power Lawn Mower until you have tried one.

For lawns, country estates, parks, schools, cemeteries and institutions. Light running, quiet and simple in construction. A "foolproof" mower, making mowing as easy as walking.

Mows 3 to 6 times more per day than a hand mower.

Write for Beautiful Illustrated Catalog

MODERN MACHINE WORKS, INC.
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You who love fine coffee

will be interested in this advertisement

No drink has ever pleased Americans like good coffee. Its fragrant cheer makes all our meals more delightful.

Yet, thousands of people who *love* coffee do not drink it at night because of the fear that it will keep them awake. Many deny themselves the pleasure of coffee at any time.

Now, all can enjoy it. . . . Today, a modern scientific achievement is taking place at Battle Creek. Here in the home of healthful foods caffeine is being extracted from the world's finest coffee beans. And so skilfully is this done that not one bit of the wonderful coffee flavor and aroma is lost!

The result is Kellogg's Kaffee Hag Coffee—a coffee without caffeine which delights the most exacting epicure. How much better than cheerless substitutes!

Serve Kaffee Hag Coffee at evening parties. Wonderful, rich coffee that every one can enjoy without hesitation.

You can enjoy Kaffee Hag Coffee at midnight. It will not keep you awake. It can never affect your nerves or be harmful in any way.

Kaffee Hag Coffee is the original caffeine-free coffee. And now, after years of continuous experiment, the blend has been wonderfully improved. There is no finer coffee on the market. A new method of packing brings every pound fresh and mellow to your kitchen. The coffee is *sealed* in vacuum tins when it leaves the roasters.

Will you try it? . . . Isn't there some one in your home who loves coffee but fears to drink it at night? Give him Kaffee Hag Coffee. Two cups, three—as many as he wants. Make it just as you make any other coffee. How pleased he'll be. And how restfully he'll sleep. Ask for Kaffee Hag Coffee at your dealer's.

Or let us send you a sample. . . . For 10c, to cover postage and handling, we will send you a 10-cup sample of this delicious caffeine-free coffee. Test it at *night*. See for yourself what satisfying, luscious coffee it is—and how well you'll sleep.

KELLOGG COMPANY, Dept. R-4, Battle Creek, Michigan

Please send me, postpaid, enough Kaffee Hag Coffee to make ten good cups. I enclose ten cents (stamps or coin). (*Offer good in U. S. A. only.*)

Name ______________________________

Address ______________________________

Kellogg's KAFFEE HAG COFFEE

Not a substitute—but REAL COFFEE *that lets you sleep*

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THE seaside boulevard of Paris, those sparkling summer resorts of the French Channel coast, the international capital of society . . golf and tennis . . Le Touquet . . through apple-blossomed Normandy, Rouen of the spires of Jeanne d'Arc legends . . . Deauville, Dinard and Biarritz, the whirl of fashion in its gayest mood . . . loiter through the chateau country where dream towers crown each hill . . . Roman France, the land of the troubadours, Avignon and the Palace of the Popes . . . the snow-crowned, torrent-riven Pyrenees with its picturesque Basque country . . . the whole Riviera with its daring sun-worshipers . . . to Dauphiné and the French Alps . . . Vittel and Contrexéville nestling in the Vosges with their famous thermal springs . . . war-shelled Verdun and Rheims with its acres of caves . . . Paris in springtime and your favorite canter through the Bois.

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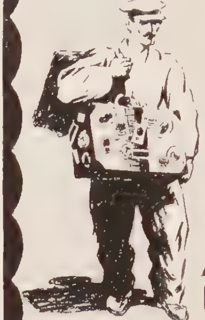

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ALL Expenses $395

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Accommodations for first-class passengers only. Reservations and literature at authorized tourist agents or Furness Prince Line, 34 Whitehall St. (where Broadway begins), or 565 5th Ave., N.Y.C.

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Prince Line Service has been continuous between New York and South America for 35 years

YOU CAN GO ROUND THE WORLD

for $1110. -

FIRST CLASS

Home Town to Home Town

Now you can roam the world in luxury on President Liners at little if any more than it costs you to live at home!

You enjoy a large cabin, amidships, looking on the sea. It is furnished with real beds, not berths. Your President Liner is the last word in comfort and pleasure—spacious, sunny decks, elegant public rooms, outdoor swimming pool. Delicious, home-like meals that you don't tire of, from a cuisine famous among world travelers.

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In addition, you have unique stopover privileges at any port. Spend two weeks or more in Hawaii, Japan, China . . . visit as long as you like in any of the odd corners of the globe that interest you . . . then continue your cruise on the next President Liner as you would on another train. You literally enjoy all the freedom of a cruise on a private yacht.

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You may start from New York, Boston, Seattle, Victoria, B.C., Los Angeles or San Francisco. Every week a palatial President Liner sails from Los Angeles and San Francisco—via the Sunshine Belt—for Honolulu, Japan, China, Manila and thence fortnightly to Malaya—Java nearby—Ceylon, (India overnight by Pullman), Egypt, Italy, France, New York.

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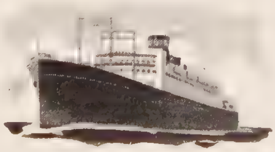

$1110 fare includes room and meals, also rail fare from any direct line point in the U. S. to Los Angeles, San Francisco or Seattle and back to starting point from New York.

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Around the PACIFIC

Geisha girls dance for you in Japan

To 19 strange ports on the great MALOLO

This year, another "Around the Pacific Cruise" by the luxurious Matson liner Malolo! Twelve countries and 19 ports of the mysterious East and exotic South Seas will be visited. Japan and China, of course—with extensive shore excursions to ancient cities and shrines. Historic Manila in the Philippines. Teeming Singapore in Malaya, Bangkok in Siam, Batavia in the East Indies. Then modern Australia and New Zealand, primitive Fiji and Samoa, and colorful Hawaii.

While America is fighting early snows, you'll be "down under" the equator where it is summer. You get back home for Christmas—your Christmas shopping already completed in the Orient's alluring bazaars.

Assuring you perfect arrangements, the Matson Line operates this second cruise in cooperation with the American Express Company. Your cruise ship is the 23,000-ton Malolo, holder of Pacific speed records, one of the world's finest liners. Sail from San Francisco September 20, return December 19.

There is but one cruise "Around the Pacific"—the Malolo's! Owing to the wide interest last year, we suggest early reservations. The membership is limited. Send today for folder to Matson Line, American Express Company or your travel agent.

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All expenses Sea and Land including
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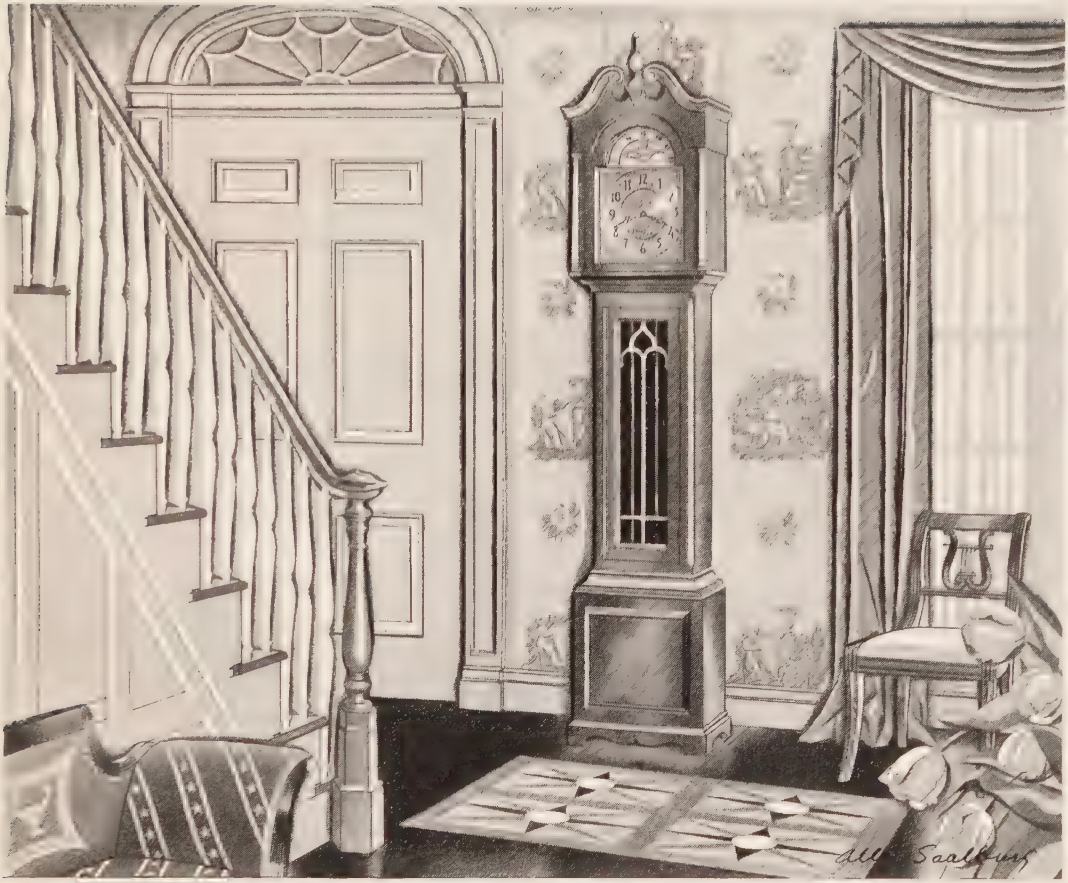


Mellow beauty of rare cabinetwork . . . melody of deep-toned chimes . . . and the accuracy of modern electric time

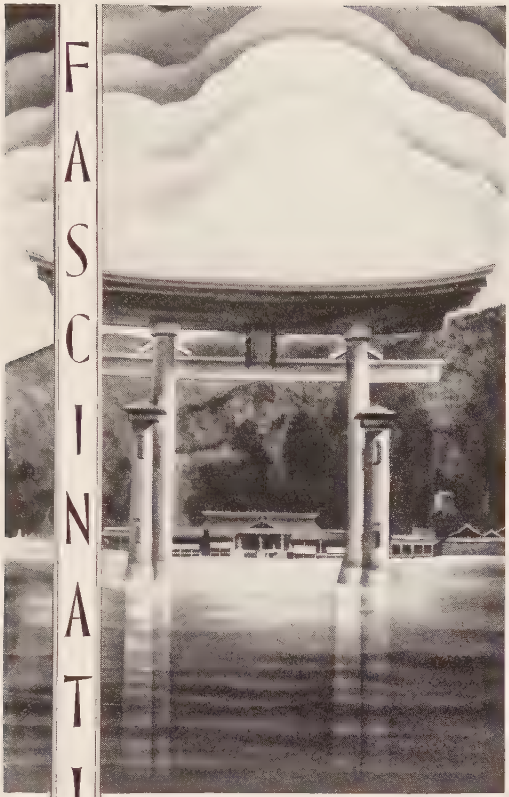
THERE are certain things about which a real home revolves. The master craftsmen of Colonial America knew it. And for those homes most worthy of the name, they created sturdy, venerable grandfather's clocks . . . marking the hours . . . showing the phases of the moon . . . filling the house with music and content. • For the homes of today, Revere has created floor clocks no whit less fine — with the greater convenience and accuracy entailed by modern life. Rich cabinetwork. Distinguished period designs. Elaborately etched and inlaid dials. Full-toned Westminster, Canterbury, or Whittington chimes. Or a ship's bell strike. • And fit complement to the artistry of these cases is the precision of the Telechron motor inside. Synchronized with the Telechron Master Clock in your power house, it delivers *accurate* time, once you've plugged in the clock and set the hands. No winding, oiling, cleaning or regulating. • Illustrated above is Hanover, a Revere Clock of authentic Colonial design. Its case is the finest Honduras mahogany. 87½″ high, it is priced at $375. • There are many other Revere Clocks, ranging in price from $40 to $1200. Write for free illustrated booklet, "Observatory Time." Revere Clock Co., 417 McMillan St., Cincinnati.

** The Warren Telechron Co. of Ashland, Mass., manufacturers of non-striking clocks at prices up to $55.*

Revere Clocks

with Telechron electric motors

FASCINATING JAPAN



FASCINATING Japan . . . land of colour, charm and courtesy, where the East blends with the West and the past with the present. . . .

Everywhere is the scenic majesty that inspires a worship of Nature. Everywhere blossom-framed shrines, temples and pagodas preserve the traditions of the centuries. Everywhere a gentle culture is seen in the festivals of the seasons, the Tea Ceremony, the "Ikebana" or flower arrangement, in the undying art symbolized by the Momoyama screens and the Ukiyoye scrolls.

And everywhere in Japan are the modern luxuries of great railroads, hotels and motor highways as well as facilities for all the smart sports.

The wonderlands of Japan, Korea, Manchuria and China are reached from the United States and Canada by the Nippon Yusen Kaisha, Osaka Shosen Kaisha, the American Mail Line, Canadian Pacific and the Dollar Steamship Line. Full information will be furnished by any of these Lines, any tourist agency, or by the

JAPAN TOURIST BUREAU

c/o Japanese Gov't Railways, 1 Madison Ave., N. Y. C.
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AROUND THE WORLD FOR ONLY $800

A joyous, pleasure-filled voyage with stops in Australia and India. A limited number of accommodations on American-flag motorships. Excellent cabins, cuisine. Fare only $800. One-way to either India or Australia—$300.

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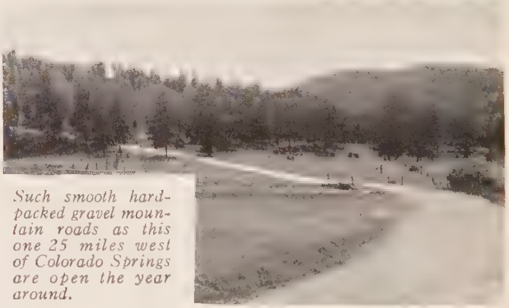
Managing Operators for U. S. Shipping Board



Such smooth hard-packed gravel mountain roads as this one 25 miles west of Colorado Springs are open the year around.

Sunshine, Health, Comfort
All the Year in a Region Famed for Beauty

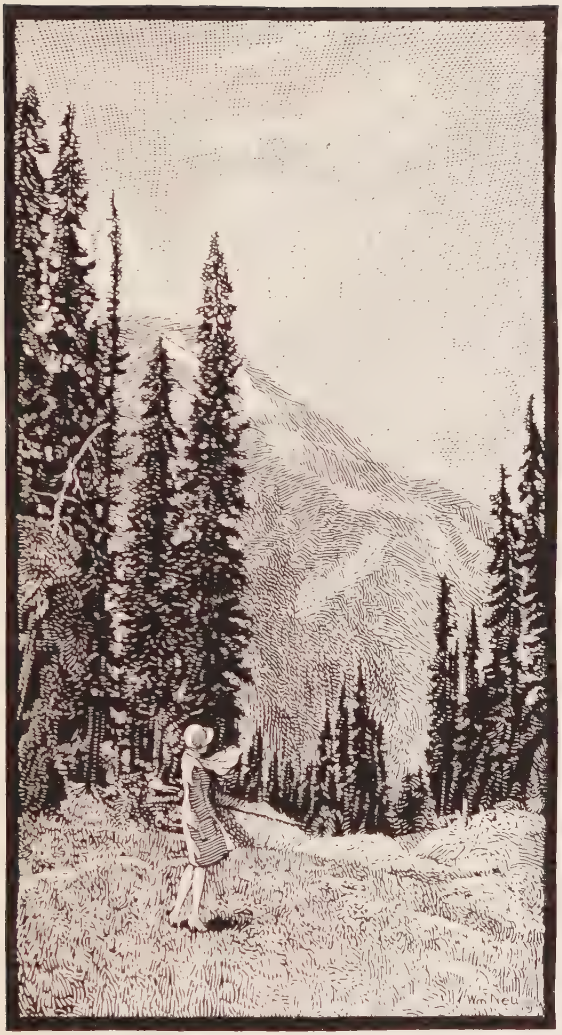
WINTER days that are mild and comfortable—in summer no enervating "stickiness," sound sleep under blankets assured every night.

The reason for such healthful, comfortable conditions in the Pikes Peak Region is that the relative humidity (dampness in the air) is less than 50%. In most places in the country it is 65% to 80%. That's why, also, there's no fog or mist or haze to obscure the brilliant sunshine which radiates healthful rays during 70% of the time the sun is up.

A wonderful spot for a rest or vacation. Free stopovers or side trips the year around. Entrancing scenery. Full detailed information on any question. Send for "Winning Health," "100 Winter Days," data on schools, living, the city, etc. Address—

THE WELCOME CLUB
400 Independence Building

Colorado Springs
Manitou
and the Pikes Peak Region



Berthoud Pass in the Colorado Rockies
(on a Rocky Mountain National Park tour)

See the Rugged Grandeur of the Rockies in

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—only one night by Union Pacific trains from Chicago, Omaha, St. Louis and Kansas City—at no more cost than an ordinary vacation. Bask in the healthful sunshine. Breathe deeply the exhilarating air of this great mountain vacation land. Hike or ride up mountain trails. Fish in sparkling streams. Swim . . . golf. Dine and dance in modern hotels. Six trains daily in season, including the de luxe Columbine.

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For full information and illustrated booklets about the great National Parks and other Western vacation regions, simply indicate your preferences on the coupon below and mail to us.

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Please send me complete information and booklets.

I am interested in a vacation trip to
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Endless variations in
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Rates include Round trip transportation, Conducted sightseeing, Hotel accommodations, etc.

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Modern luxury aboard ship. Routes of absorbing interest and charm. Magnificent scenery. Customs of bygone centuries. The palatial S. S. New Northland for Gaspe, Newfoundland, the Saguenay. Other vessels for Newfoundland via the Gulf's north shore, Canadian Labrador. Ask any Travel Agent or AA

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JASPER National Park and 5300 square miles of untamed grandeur in the highest Canadian Rockies offer all that any vacationist can demand.

Tall peaks to climb, on your own or with Swiss guides, glaciers and canyons to explore; trail rides; motoring over excellent roads; golf on a scenic championship course; tennis; swimming in a warmed outdoor pool—assure a vacation programme full of enjoyment and romance.

Jasper Park Lodge enhances your pleasure with the unostentatious luxury of fully serviced log cabins and the charming Central Lodge for bridge, music, dancing and congenial social contacts.

Jasper Golf Week
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Full information from any Canadian National Office

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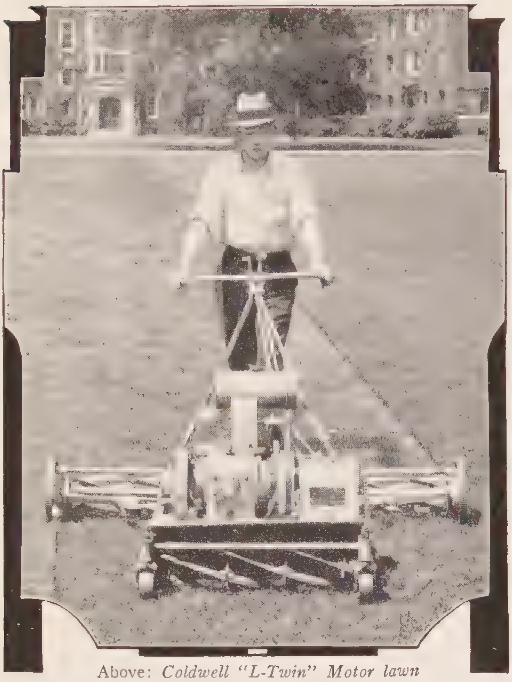
COLDWELL
SINCE 1867



Above: *Coldwell "L-Twin" Motor lawn mower and roller. Mows and rolls simultaneously 4 to 6 acres a day. With gang units attached, machine cuts 10 acres a day on one gallon of gasoline. Unexcelled for hilly lawns.*

Modern motor lawn mowers and rollers of *time-proved* Coldwell quality

LIKE all Coldwell lawn mowers, the new Coldwell motor lawn mowers and rollers are thoroughly dependable and economical to operate. Reasonable in price.

Four models to choose from. Let your local Coldwell dealer show you how quickly and how efficiently a Coldwell motor lawn mower will mow and roll your lawn. No obligation for demonstration. Descriptive literature on request.

COLDWELL LAWN MOWER COMPANY, Newburgh, N. Y., U. S. A.
In Canada, Taylor-Forbes Co., Ltd., Guelph
Manufacturers of Dependable Lawn Mowers
HAND, HORSE, GASOLINE, ELECTRIC

And when she parades the avenue . . . . She'll adore these flowers from you . . . .

Say it with

FLOWERS

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Earpiece No Bigger Than Dime Wins Enthusiastic Following

Ten-Day Free Trial Offer

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A trademark to dispel uncertainty

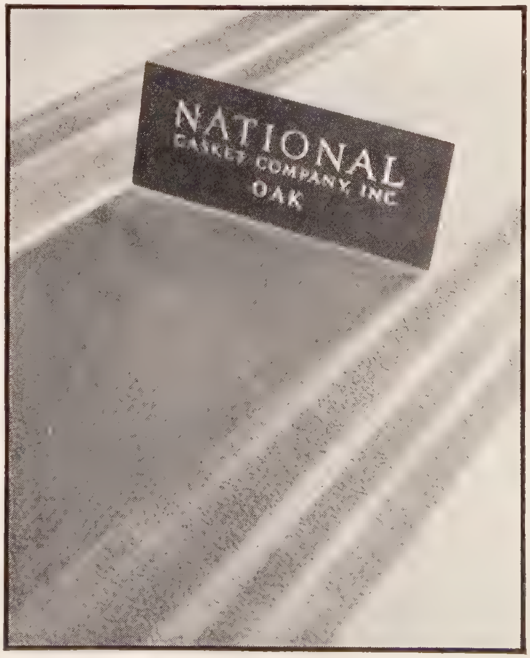
THE SELECTION of a casket is too often based solely on external appearance. There are other factors deserving at least equal consideration. Is it not equally important to know the degree of protection afforded . . . the quality of the materials used . . . the workmanship underlying the exterior beauty?

There is a quick and easy way to determine these values . . . the trademark of the National Casket Company.

This trademark appears on every National casket. It is inconspicuously placed, but plainly visible. It states of what material the casket is made. It pledges authenticity of style. It is the purchaser's guarantee of quality workmanship—the word of a company with a reputation for reliability extending over nearly fifty years.

National caskets are sold by funeral directors throughout the length and breadth of the land. It is reasonable to suppose that the funeral director who handles merchandise of high quality has similar high standards of service.

To throw authoritative light on a little-known subject, the National Casket Company has published a little book, "Funeral Facts." We shall be glad to send a copy without charge in a plain envelope upon request. Just write Department L3, National Casket Company, 60 Massachusetts Avenue, Boston, Mass.



NATIONAL CASKET COMPANY
INCORPORATED
DISPLAY ROOMS IN TWENTY-SEVEN CITIES

The illustrations in this magazine, both black and white and color, also the printing of the color plates, are the product of The Beck Engraving Company . . . . .

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Longer tours sail in Spring and Summer to Egypt, Palestine, Italy, Norway.

Send for booklets.

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443-D Park Square Building
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For use on public or private lawns, regardless of size

The Cooper POWER LAWN MOWER

Has proven itself efficent and economical. It rolls as it cuts, and can be handled with ease over level or uneven turf around trees or shrubbery, up and down steep and sloping terraces. Cooper Mowers are made in two sizes . . . 27 and 20 inch . . . with all steel . . . frames, ball and roller bearings throughout, and many exclusive operating features not found on any other mower. Write for descriptive booklet:

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YOUR LAWN

COOPER MFG. CO., 506 North First Ave.
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An aristocrat of the highways

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Replacing your window screens—building or remodeling—you will want to look over the

Illustrated Rolscreen Booklet mailed upon request.

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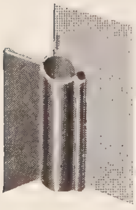

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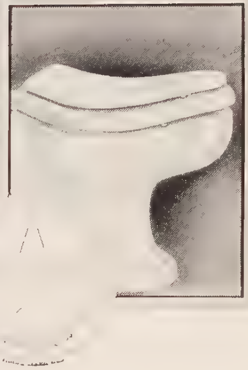

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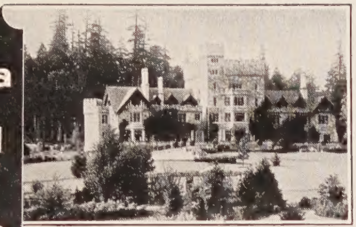

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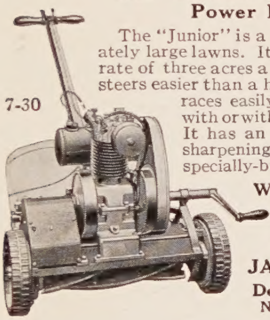

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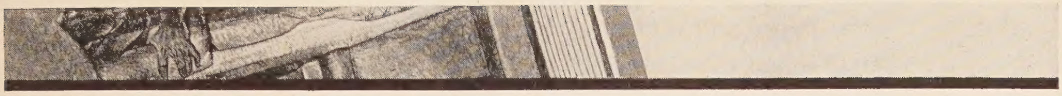

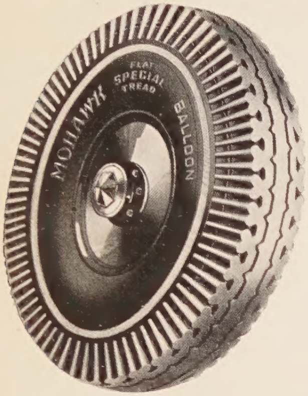

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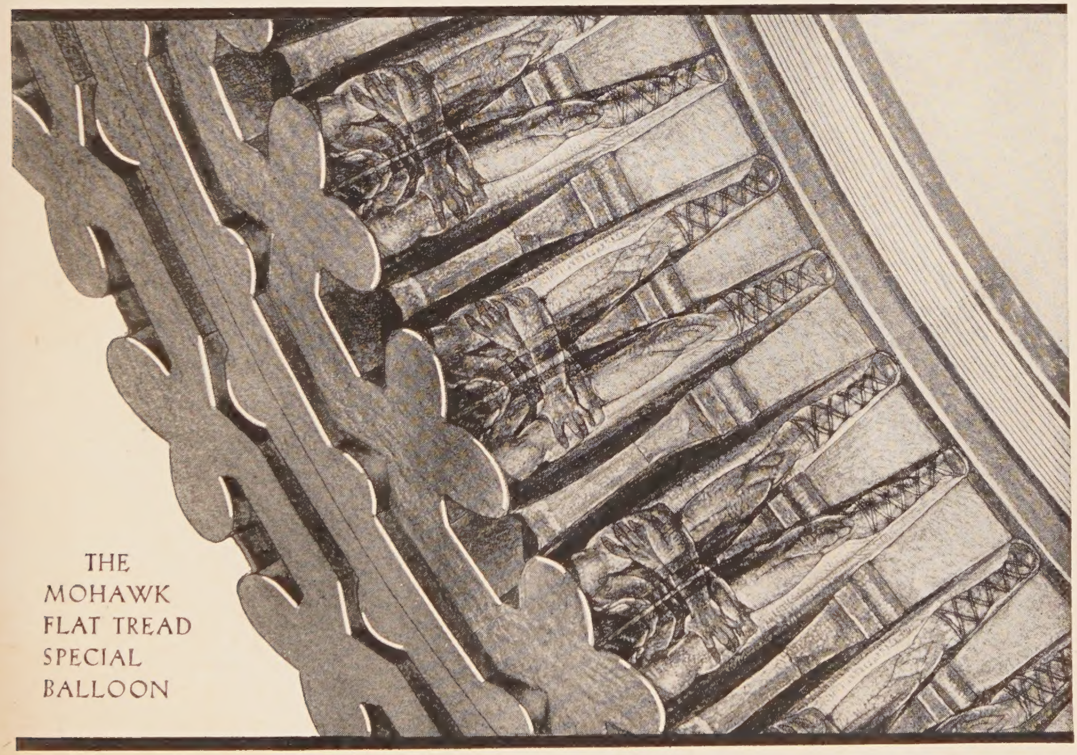

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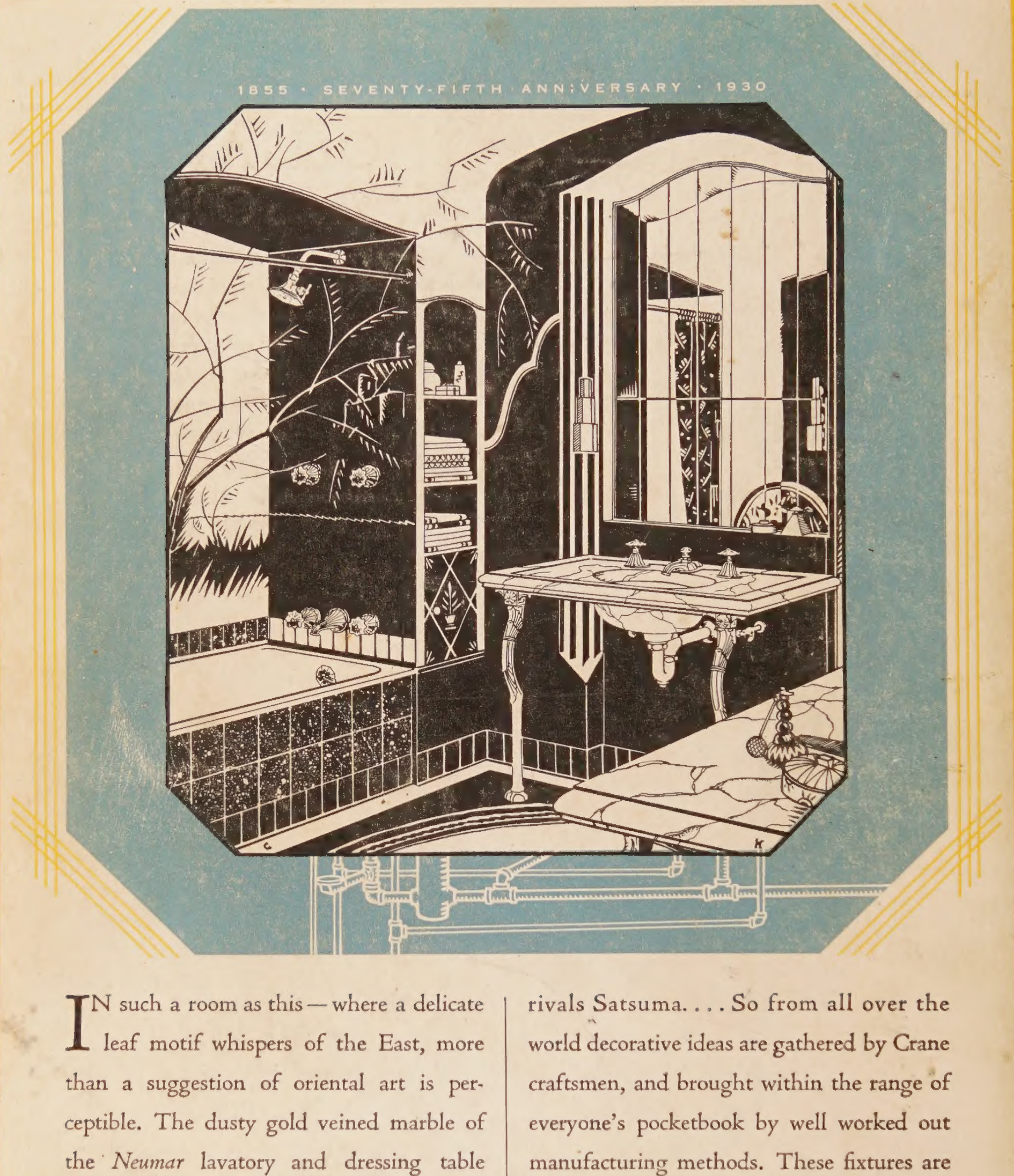

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